

REPORTING ON A SUCCESSFUL EXPERIENCE IN EDUCATING INFORMATICS STUDENTS IN COMMUNICATION SKILLS: BEYOND A SINGLE SUBJECT TOWARDS THE FULL CURRICULUM

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1. Introduction

Motivation:

Improve computing students' communication skills

Context:

- ✓ Most international studies and reference curricula recognize the importance of communication skills for computing students: Tuning project, IEEE/ACM Computing Curricula, 2009 Job Outlook from NACE...
- ✓ The Bologna process implies the reform of university studies and highlight the need for education in soft skills
- ✓ UOC, a Catalan/Spanish virtual university, established in 1995, now with 55.000+ students
- ✓ UOC ICT studies, since 1997, with 5.000+ students

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2. Our Approach

Main goal:

To address the written communication difficulties of our students...
(... 1st somewhere... 2nd everywhere in the curriculum)

First phase (2002-04, 2004-10)

- ✓ Design an opt. subject *Communicative competence for IT professionals* specifically to improve our students' communication skills. Then spread and
- ✓ ~~analyze~~ include this subject as mandatory in the first year of all of our ICT curricula: Bachelors on Informatics Engineering, on Telecommunication Engineering and on Multimedia systems.

Second phase (2010 onwards)

- ✓ Extend to a more ambitious and transversal teaching/learning system, through a progressive and continuous learning service system supported by an evidence-based evaluation model.

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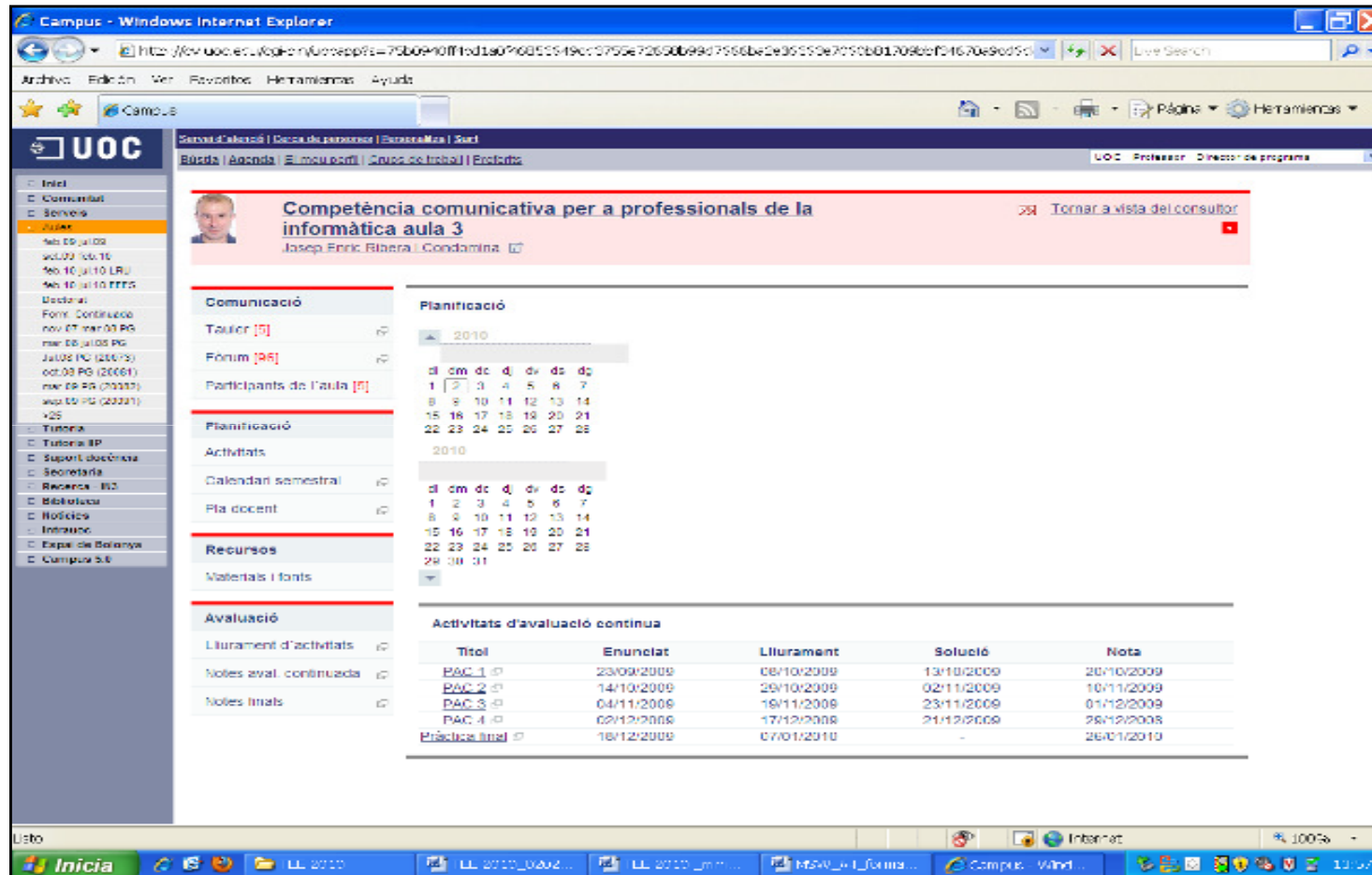
3. First Phase: the initial subject

Initial approach (2002-04)

- ✓ Subject designed based on the analysis of different alternatives, after reviewing the main references from computing curricula and the literature on teaching communication skills.
- ✓ Subject with a solid and relevant Text Linguistics theory to provide basic knowledge and to become a practical reference point to students on their future writing tasks along the rest of career and profession.
- ✓ Subject contents oriented to address the main writing problems of our computing students, ie. computing professionals.

3. First Phase: the initial subject

Learning environment



A virtual classroom at the UOC Campus

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3. First Phase: the initial subject

Contents

Based on Text Linguistics and text properties.

Syllabus organized around three themes: basic concepts, general characterization of most texts of our discipline, and production techniques for specialized texts

Centred on structuring texts and on their communicative effectiveness

Only with real examples of texts from computing situations, either professional or academic.

Subject versions: From 2004-05 onwards in Catalan,
From 2009-10 onwards, also in Spanish

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3. First Phase: the initial subject

Quantitative data

- ➡ The subject has been taken by 1738 students.
- ➡ The analysis of the evolution of the subject over the 2004-10 period basically refers to three indicators:
 1. Registration (given its elective nature)
 2. Academic performance (final and partial evaluation)
 3. Student satisfaction (wrt. standard university survey):
 - 3.1 satisfaction with the subject
 - 3.2 satisfaction with the teaching action
 - 3.3 satisfaction with the teaching-learning resources
 - 3.4 satisfaction with the form of assessment

3. First Phase: the initial subject

Quantitative data: *Registration*

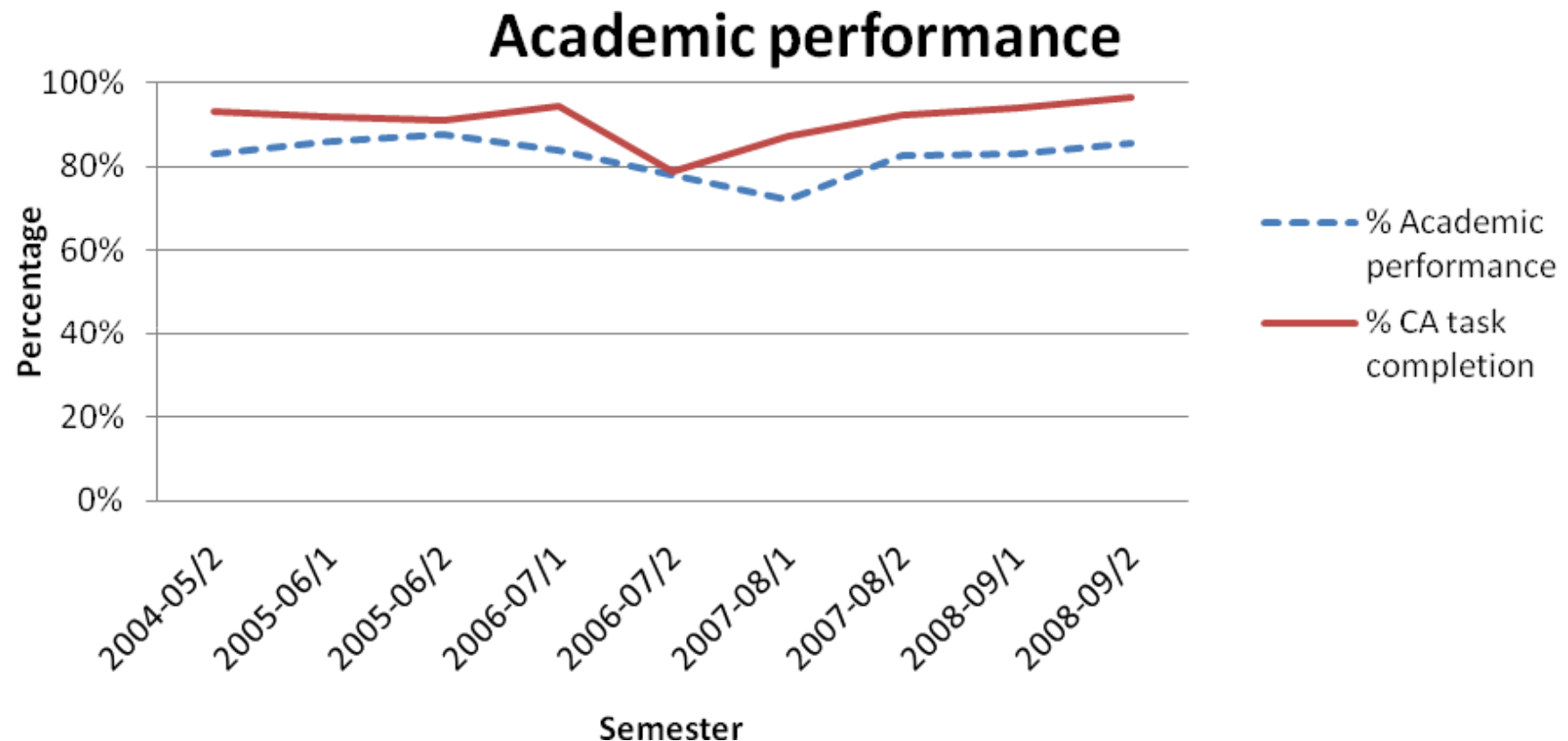
<i>Year/Semester</i>	<i>Number of registered students</i>
2004-05/2	99
2005-06/1	148
2005-06/2	158
2006-07/1	131
2006-07/2	99
2007-08/1	54
2007-08/2	166
2008-09/1	147
2008-09/2	177
2009-10/1	121

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3. First Phase: the initial subject

Quantitative data: *Academic performance*

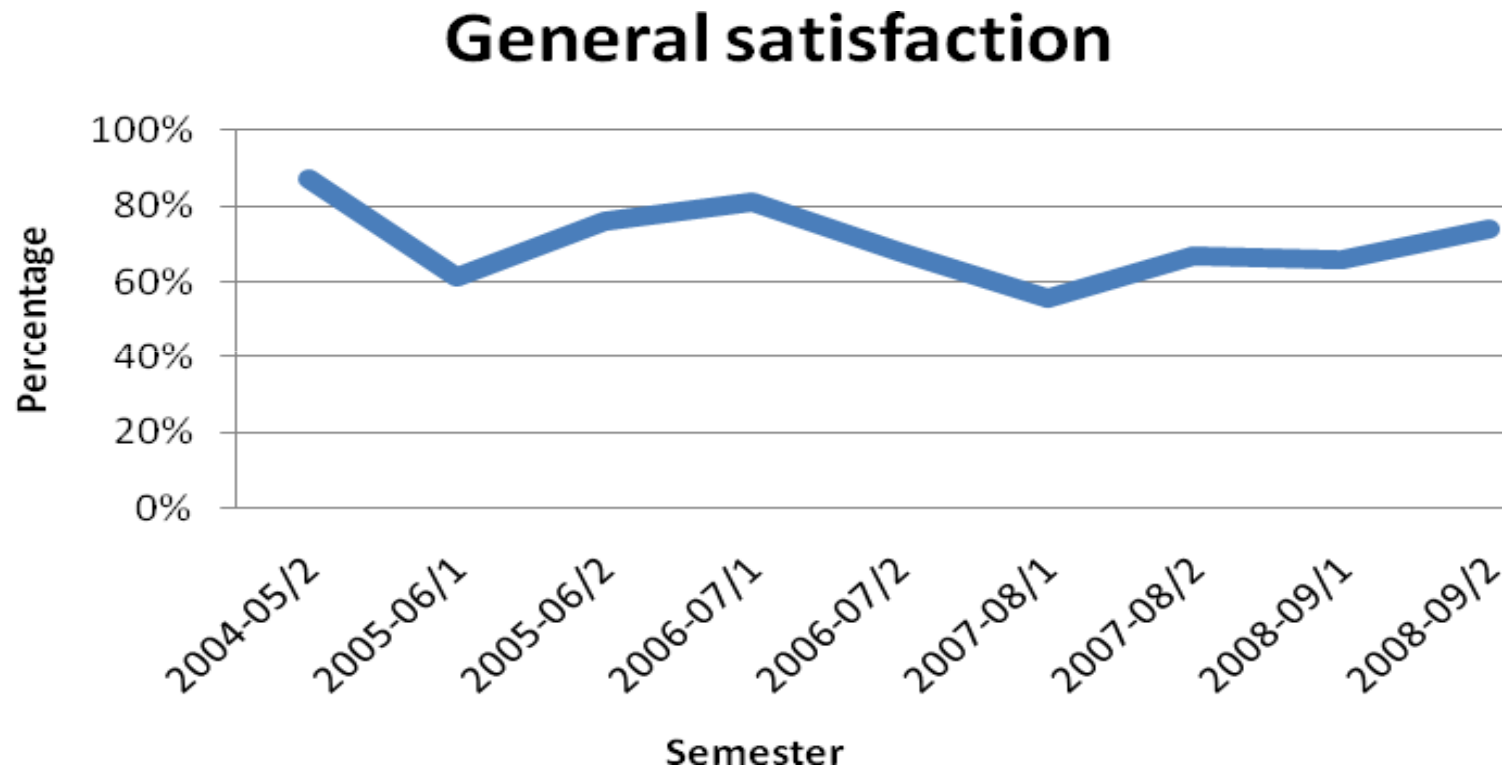


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3. First Phase: the initial subject

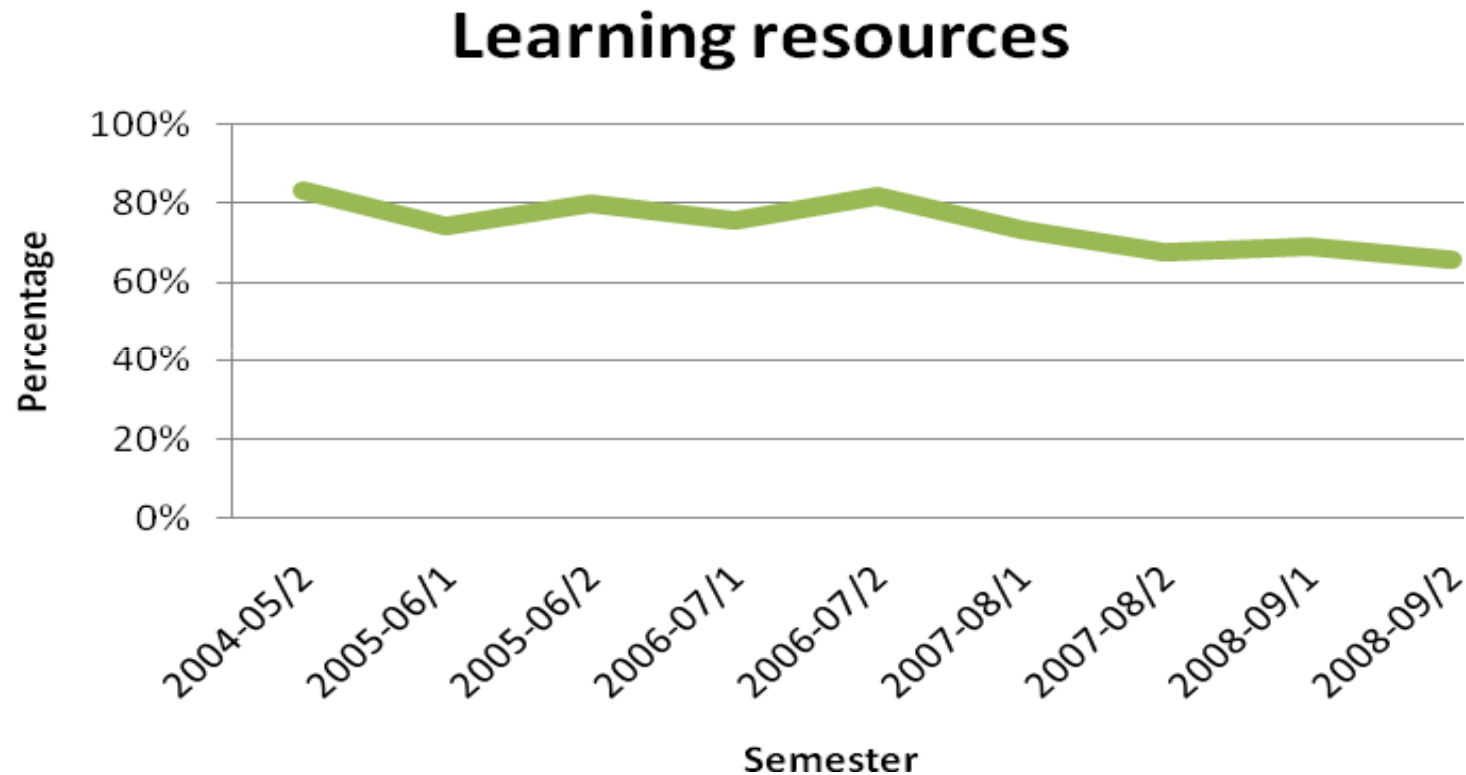
Quantitative data: *Student satisfaction:*
1. *General satisfaction*



3. First Phase: the initial subject

Quantitative data: *Student satisfaction:*

2. Satisfaction with the learning resources



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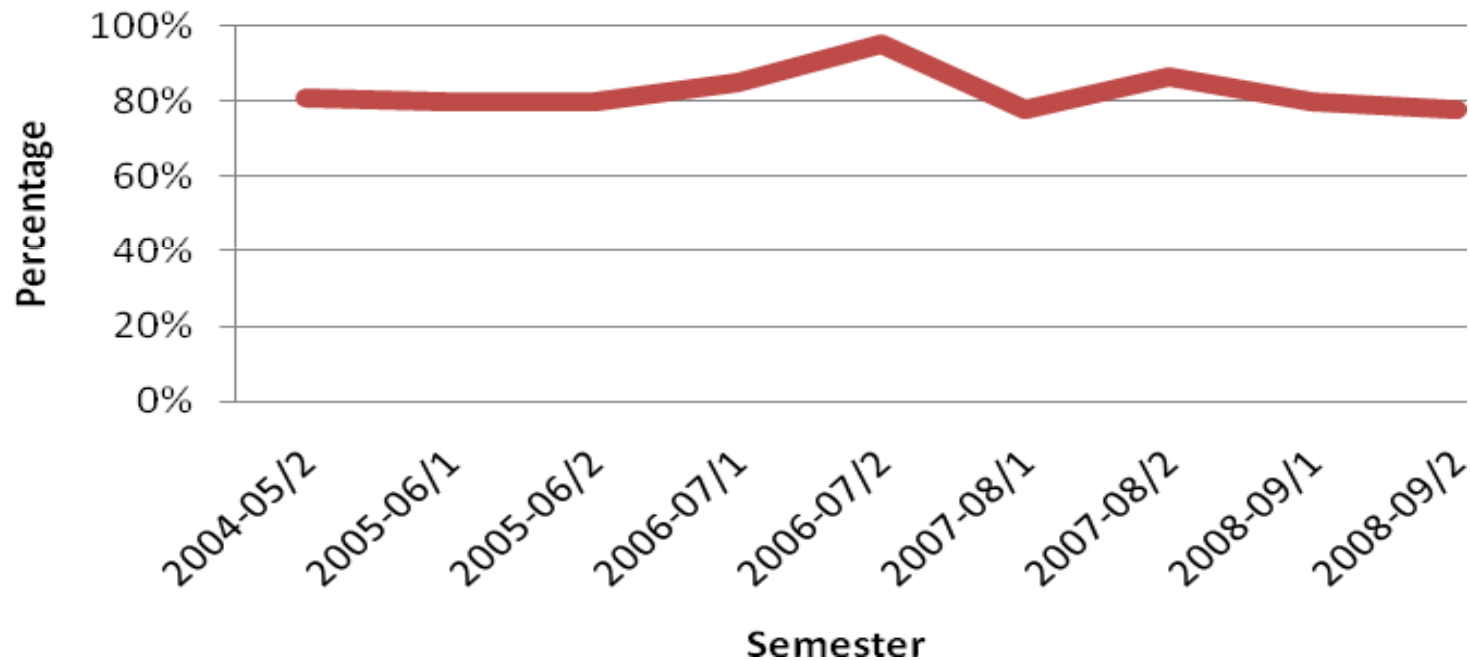
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3. First Phase: the initial subject

Quantitative data: *Student satisfaction:*

3. Satisfaction with the teaching action

Consultancy action

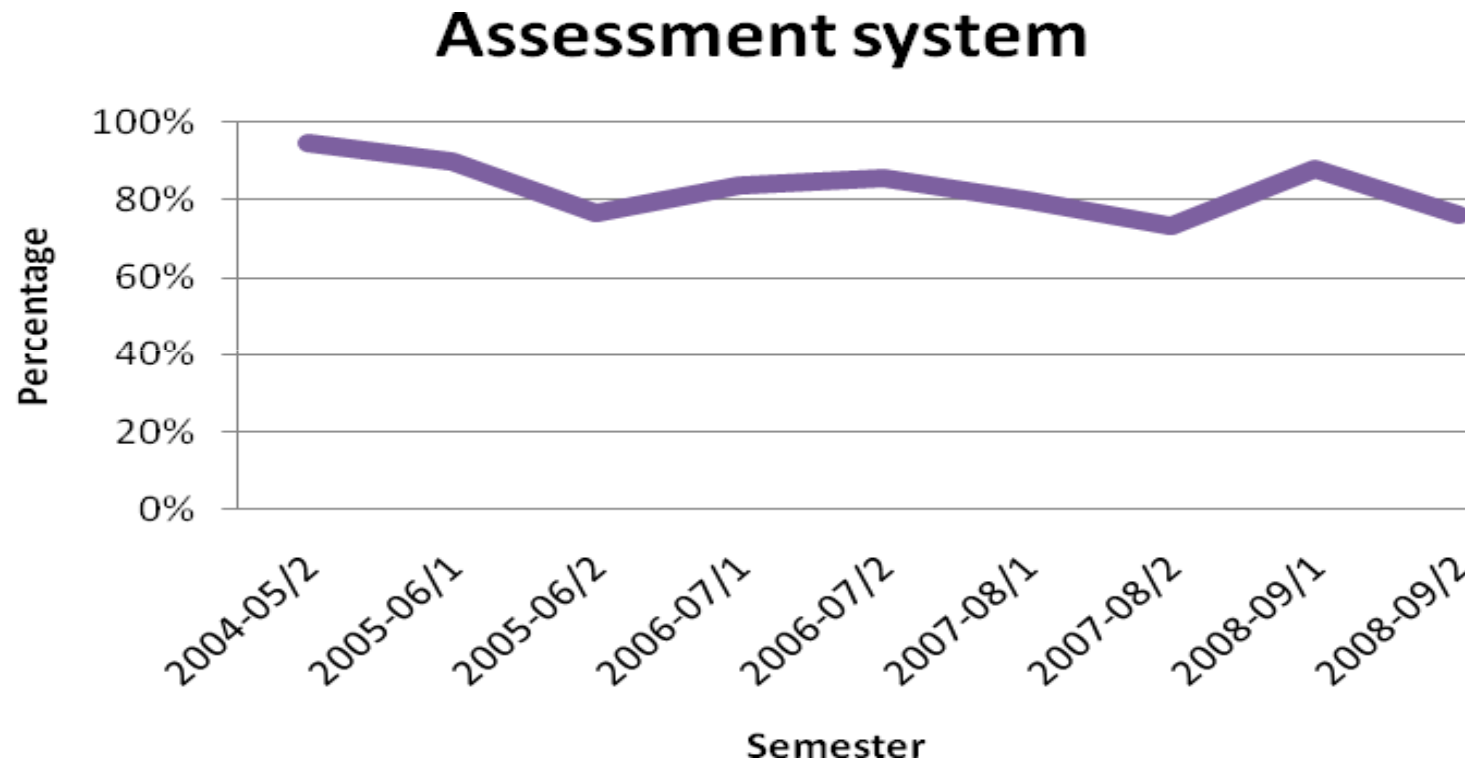


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3. First Phase: the initial subject

Quantitative data: *Student satisfaction:*
4. *Assessment system*



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3. First Phase: the initial subject

Qualitative data

- ➡ Each semester we do a specific final assessment of the subject to receive comments, complaints, needs, suggestions, thanks, etc. from the students.
- ➡ Comments of 131 students were analysed initially with the Atlas.ti qualitative analysis tool. This analysis allows to classify the main items that students mention (positive and negative):
 1. Excellent attention received from consultants (teachers).
 2. Recognized usefulness of the subject (for work and studies).
 3. Difficulty in working with contents, so different from technical.
 4. Need to have the subject in Spanish, then to have it open.
 5. Request for new learning resources, to address new growing weaknesses in grammar and spelling, not yet included.

3. First Phase: the initial subject

Main positive aspects:

- ➡ ✓ **Teaching action.** Specially individual feedback.
- ➡ ✓ **Course materials.** A good balance between the academic rigor and practical application to academic/professional world.
- ✓ **Students' interest and motivation.** They want to improve their writing communication competence because they are convinced that this will be useful in their professional live.

Aspects that need improvement:

- ➡ ✓ **Expand the classroom resources,** by adding elements related to grammar and spelling.
- ➡ ✓ **Systematize data collection and analysis,** specially for qualitative data, starting with an ad-hoc survey.
- ➡ ✓ **Reduce the workload for the teachers,** empowering them with tools to give rich individual feedback.

4. Second Phase: learning along the curricula

Approach

- ✓ Progressive learning of the communication competence, based on the **continuous practice** of the contents learnt on the initial subject, throughout the rest of curricula subjects, shown and tested at some specific critical points.
- ✓ Based upon well-designed **rubrics and evidenced-based** learning and evaluation methodology.
- ✓ With the support of **a professor-tutor** who, once past the mandatory subject, follows and assists the student in the selection and evaluation of the evidences that s/he proposes for consideration.
- ✓ With the support mainly of a tool, the **electronic transfolio** (ie. across-the-curriculum e-portfolio) to manage all the information involved: evidences, rubrics, evaluations, competence level updates, ...

4. Second Phase: learning along the curricula

The screenshot shows the main interface of the eTransfolio system. At the top, it identifies the user as 'Jaume Ruscalleda' and the course as 'Master Universitari en Educaci3n'. The interface includes navigation tabs for 'COMPETENCIAS', 'DIARIO REFLEXIVO', and 'CRITERIOS DE EVALUACI3N', along with links for 'Glosario', 'Ayuda', and 'etranfolio p3blico'. The main content area is a table with columns for 'Competencias transversales', 'Evidencias', 'Estado', 'Evaluaci3n final', 'Autoevaluaci3n', and 'Mensajería'. The table lists various evidence-based learning activities, such as 'Propuesta evidencia 2' and 'Nombre evidencia 1', with their respective states (Finalizada, En proceso, No iniciada) and final evaluation status (En desarrollo, Pendiente). Each row includes an 'Autoevaluar' button and a document icon. A tooltip is visible over the fifth row, displaying a block of placeholder text.

Competencias transversales	Evidencias	Estado	Evaluaci3n final	Autoevaluaci3n	Mensajería
1 Capacidad para el análisis y la síntesis	Propuesta evidencia 2 Nombre evidencia 1	● Finalizada ● En proceso	En desarrollo	Autoevaluar	📄
2 Capacidad lorem ipsum	Nombre consecutur	● No iniciada	Pendiente	Autoevaluar	📄
3 Capacidad lorem ipsum dolor sit amet consecutur maribo est	Nombre evidencia 1	● No iniciada	En proceso	Autoevaluar	📄
4 Capacidad lorem ipsum	Nombre consecutur	● En proceso	Pendiente	Autoevaluar	📄
5 Capacidad lorem ipsum dolor amet consecutur est	Propuesta evidencia 2 Nombre evidencia 1	● Finalizada ● En proceso	En desarrollo	Autoevaluar	📄
6 Capacidad lorem ipsum dolor amet consecutur est	Propuesta evidencia 2 Nombre evidencia 1	● Finalizada ● No iniciada	En desarrollo	Autoevaluar	📄
7 Capacidad lorem ipsum dolor amet consecutur est	Nombre consecutur	● No iniciada	Pendiente	Autoevaluar	📄
8 Capacidad lorem ipsum	Nombre evidencia 8	● En proceso	Pendiente	Autoevaluar	📄

Tool for evidence-based learning: eTransfolio main screen

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5. Conclusions and future work

The experience of *Communication Competence for Computing Professionals* has proven to be very valuable to stakeholders (students, teachers, managers), with a positive and motivating impact on a high number of students.

As such, it has been a pioneering initiative in Spain, that has been shared with other Catalan and Spanish computing schools (experience explained locally, open books sent).

Transversal learning system can improve the experience, but detailed service system must be carefully designed, with new roles well defined, and with a new risky scenario (ie. mandatory massive subject) that needs a somewhat new approach.

Risk-management-guided design and incremental implementation of the new learning system is now being undertaken, including a well-defined ad-hoc IS for supporting the teaching, learning and management tasks involved in the new scenario.

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Thanks for your attention !

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