The ECDL Certification of ICT Usage Skills in the Italian Universities

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Abstract

We present the results of a monitoring exercise whose objectives were to analyze the experiences of the Italian Universities in the framework of the ECDL programme and to assess the impact of the ECDL certification in the Universities. Our investigation focused on the ECDL projects carried out by 50 Universities in the year 2004. The analysis has shown that the ECDL certification was used by the majority of the Universities to assess the basic computer skills of their students. On the contrary, the organizational and teaching profiles of the Universities varied as a function of their size.

1. Introduction

The Italian Government, following the EU Lisbon summit held in the year 2000 [1], started a program to increase among the citizens the ability of using information technologies. Special attention was devoted to the University students: the Italian Ministry of Education, Universities and Research made a specific choice, inserting in all University curricula credits devoted to acquire some specific knowledge of ICT technologies.

The development of basic ICT abilities in our Higher Education system is hindered by the high heterogeneity of practices and policies following from different educational priorities, professional goals and funding sources. Establishing a practical benchmark capable of defining a good nation-wide educational ICT profile is quite difficult. A practice that has worked well in one context, may not work at all in a different one. The wide diversity of educational systems employed in Italian Universities prevented the transfer of practices from one environment to another.

The Ministry then decided to endorse the standard of the European Computer Driving License (ECDL). This programme addresses the problem of establishing a benchmark of basic ICT skills, i.e., skills that everyone should possess [10].

The ECDL programme was initially introduced in Finland and then promoted at European level [3] by CEPIS (Council of European Professional Informatics Societies http://www.cepis.org). Currently, the governing body of the programme is the European Computer Driving Licence Foundation (ECDL-F http://www.ecdl.com). AICA, the Italian member of CEPIS, is the certification authority that manages the programme in our country.

The main features of the ECDL programme can be summarized as follows:

- *internationality*: 137 countries world-wide have adopted the programme; the certification exam, based on the so-called QTB (Question and Test Base), is available in 32 languages;
- *integration between academia and industry*: the programme is supported by the national professional societies that integrate professional and academic competences;
- *technological neutrality*: the programme defines ICT skills independently of hardware and software vendors; in particular, it is possible to obtain the certificate using only open source non proprietary technologies.

The ECDL certificate proves that its recipient possesses some basic skills in using a computer, such as editing a document with a word processor, preparing a table using a spreadsheet, querying a database, browsing the Web.

The ECDL syllabus consists of seven modules:

1. Basic concepts of information technology

2. Using the computer and managing files
3. Word processing
4. Spreadsheets
5. Database
6. Presentation
7. Information and communication.

The certification is released to whomever correctly performs a set of activities randomly extracted from the QTB, which is not public. The exam is fully automatic. There are two types of certificate: a START license (obtained after passing the exams of four out of seven ECDL modules) and a FULL license (obtained after passing the exams of all seven ECDL modules). Exams take place in Test Centers. In Italy, these Centers are specifically accredited for this purpose by AICA.

The ECDL programme is ten years old, and millions of people have already received an ECDL certificate all over the world. Some papers study its impact in Higher Education. In [5] the impact of the ECDL programme in Irish Universities is evaluated. The diffusion of the ECDL programme in the Italian Universities in the year 2003 is presented in [2]. In [4], the ECDL programme is used as a reference standard to define basic skills of nurses and nursing staff. The results of a project for forming University staff for ECDL via e-learning technologies are analyzed in [8]. In [9], authors describe how the programme can be adapted to special situations, like for instance those dealing with students with physical handicaps.

In this paper we present the results of a monitoring exercise aimed at analyzing the experiences of the Italian Universities in the framework of the ECDL programme in the year 2004. Our analysis focused on both the organizational and teaching aspects addressed by the Universities in the implementation of their ECDL projects. The results reported in this paper refer to 50 Universities that had ECDL projects active in the year 2004. As a similar investigation was carried out for the year 2003, in what follows, we also present a few comparisons between the outcomes of the two analyses.

The paper is organized as follows. Section 2 presents some quantitative results related to the performance of the ECDL programme. Section 3 focuses on the organization adopted by the Universities to teach the ECDL syllabus. The position of the Universities with respect to the credits awarded to the students is discussed in Section 4. The organizational and teaching profiles that characterize the Universities are presented in Section 5. Finally, a few conclusions are drawn in Section 6.

2. ECDL performance

As already pointed out, the results of our investigation refer to the ECDL activities performed by the Italian Universities in the year 2004. A first interesting result of our investigation concerns the level of diffusion of the ECDL programme in the Italian Universities. It is worth to underline that in the year 2004, it was active in the 92.6% of the Universities, that is, 50, that participated to our monitoring exercise.

Another important aspect of our investigation deals the number of students involved in the ECDL programme. For the year 2004, this number was equal to 50,755, and among these students, 25,263, that is, about 50%, were females. The number of students involved in the ECDL programme in the year 2003 was much higher, namely, equal to 101,635.

It is worth to underline that the reduction of this number is linked to both the decrease of number of students enrolled in the Universities and to increased diffusion of the ECDL programme in high schools.

A fundamental outcome of ECDL programme is represented by the number of exams, related to the single ECDL module, performed by the students. In the year 2004, the total number of exams performed by the students was equal to 144,649. The number of exams passed by the students was equal to 120,266, with a success rate equal to 83.14%. By comparing these results with the results of the year 2003, we notice an 18% increase of the success rate, that is, the students did much better in the year 2004.

The investigation has then examined the number of ECDL START and ECDL FULL certifications awarded to the students during the year 2004. The analysis has shown that 11,842 students received the ECDL START certification, whereas 8,612 students received the ECDL FULL certification. This means that about 40.3% of the students involved in the ECDL programme received a certification. In particular, 23.3% of the students received the ECDL START certification and 17% received the FULL certification.

Table 1 summarizes the performance of the ECDL programme in terms of number of exams and number of certifications awarded to the students in the years 2004 and 2003. The table also shows the relative difference between the two years.

Table 1 – Performance of the students in the years 2004 and 2003.

	Year 2004	Year 2003	Δ
Number of exams performed	144,649	124,159	+14%
Number of exams passed	120,266	98,849	+18%
Number of ECDL START certifications	11,842	10,759	+9%
Number of ECDL FULL certifications	8,612	8,029	+7%

As can be seen, in the year 2004, both the number of exams performed by the students and the number of

exams passed increased by 14% and 18%, respectively. Moreover, even though the number of students involved in the ECDL programme in the year 2004 was much lower, the number of ECDL certifications awarded to the students was higher. This means that the ECDL programme had a much better performance in the year 2004.

3. Teaching organization

An important aspect of the ECDL programme deals with the organization chosen by the Universities to teach the ECDL syllabus. ECDL teaching can rely on different methods, namely, classroom teaching (with the co-presence of teacher and students), self-learning, and blended learning (that combines classroom and self-learning methods). Each University can typically adopt more than one method since teaching activities are typically customized to the background of the students and to the requirements of the individual curricula.

Our analysis has shown that 32 Universities, that is, 64% of the Universities that participated to our monitoring exercise, adopted some form of blended learning, whereas classroom teaching and self-learning have been chosen by 26 and 28 Universities, respectively.

By looking at the combinations of the various teaching methods, it is interesting to notice that the teaching activities of 26 Universities, that is, 52%, relied on more than one teaching method and among these Universities, 14 adopted all the three methods. The analysis has also shown that the majority of the Universities that chose only one teaching method, namely, 11 out of 20 Universities, relied on blended learning.

The organization of teaching activities was further analyzed by focusing on the number of hours taught for each ECDL module. On the average, the Universities organized courses whose duration ranged between 6.5 hours, corresponding to the "*Using the Computer and Managing Files*" module, and 9.3 hours, corresponding to the "*Database*" module.

To get better insights in the teaching organization chosen by the Universities, we analyzed the number of hours taught for each ECDL module. Figure 1 plots the corresponding distribution. Note that the distribution refers to the Universities that offered courses for the individual ECDL modules. Indeed, the teaching activities of a few Universities did not cover all seven ECDL modules mainly because these Universities focused on the ECDL START certification, that requires only four out of the seven ECDL modules. The figure shows that the choices operated by the Universities were rather uniform. In the majority of the Universities, the classroom teaching activities dedicated to each ECDL module did not exceed 8 hours, whereas the duration of very few courses exceeded 12 hours. Negligible was the number of Universities that offered courses whose duration exceeded 20 hours.

Another interesting result deals with the presence of tutors to support the teaching activities. The analysis has shown that 44% of the Universities employed tutors to help students with the laboratory experiences carried out during classroom teaching. Moreover, 50% of the Universities employed tutors as an aid for students during the whole ECDL learning process. This is particularly important because of the increasing presence of self-learning either used in isolation or in combination with classroom teaching.

Self-learning experiences have been investigated by analyzing the types of learning resources used to support these activities. On-line and off-line multimedia and printed material were typically used in combination. Even though there were a few Universities that

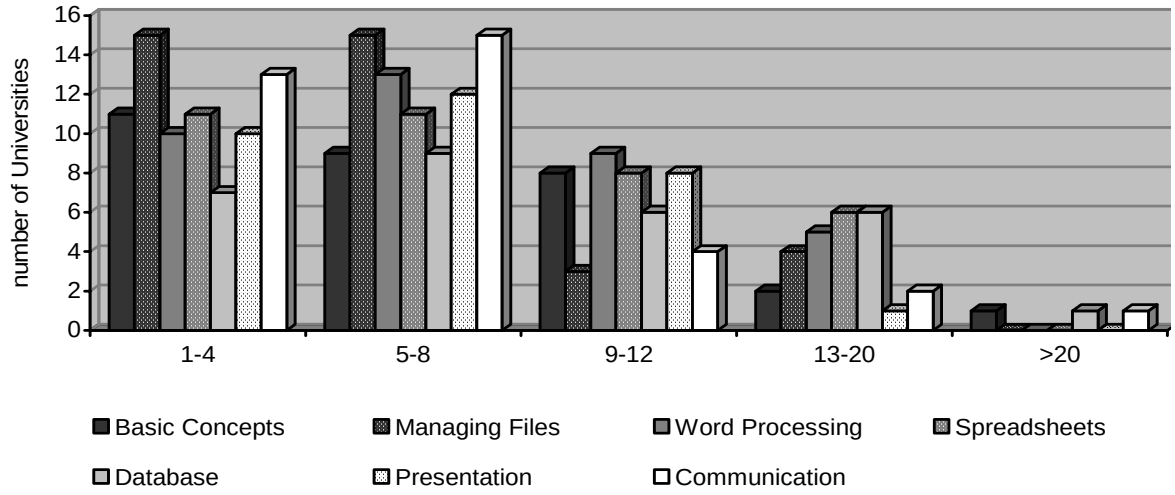

Figure 1 – Distribution of the number of hours taught by the Universities for each ECDL module.

developed their own learning resources, the majority of the Universities relied on material available on the market, with a preference towards off-line material.

4. Credits

In our investigation, we also focused on the importance granted to the ECDL certification inside the curricula of University students. For this purpose, we evaluated the number of credits associated to the ECDL certification by the Universities involved in our monitoring exercise.

As a consequence of the Bologna pan European agreement dated 1999 – aimed at improving and standardizing Higher Education for people all over Europe – the Italian University system introduced the credit (usually referred with the acronym *CFU*, deriving from the Italian definition of Credito Formativo Universitario) as the measurement unit to quantify the learning effort required for students to graduate. Following the recommendations of the ECTS (European Credit Transfer System) a full time Italian University student is expected to "earn" 60 *CFU*s per year, where each *CFU* corresponds on the average to 25 hours of global student effort (i.e., lectures, exercising, laboratories, and individual study).

Due to the autonomy of each University in defining the *CFU* distribution of its own curricula, no common specification of the number of *CFU*s corresponding to the ECDL certification has been given. As a result, the Italian Universities made very different choices, as shown by Figure 2, which presents the minimum and maximum number of *CFU*s associated with the ECDL certification. As can be seen, the number of *CFU*s awarded to the ECDL certification ranged from 0 to 10. This clearly shows the lack of any reference agreement among the Universities.

Actually, if we look at each single University, we definitely find a more regular behavior: as represented in Figure 3, most Universities adopt very limited ranges of *CFU*s (i.e., difference between the maximum and the minimum number of *CFU*s associated with the ECDL certification) for their own curricula.

However, to better comply with the aim of improving the student mobility across Universities, some reference values would be very beneficial. For this purpose, it is possible to notice that the distributions shown in Figure 2 are characterized by mean values equal to 2.89 and 5.31, respectively, and that the modes of these distributions are equal to 3 and 6. This range of values seems then a reasonable reference for the ECDL certification.

Different considerations deserve the Universities that assigned zero *CFU* to the ECDL certification: for these Universities, the ECDL certification was clearly considered as a pre-requisite for the corresponding academic programme. In perspective, this choice seems the most appropriate: the level of competence certified by the ECDL programme is actually very basic, and increasingly owned by high school students before entering the University.

5. Organizational and teaching profiles

A multivariate statistical analysis, based on both Correspondence Analysis (CA) and Principal Component Analysis (PCA) [6] [7], allowed the identification of some profiles characterizing the management of the ECDL programme in the Italian Universities. To this end we used also a supplementary variable, namely, the size of the Universities: large, medium or small size, "superlicei", polytechnic, and private. Both CA and PCA highlighted two main profiles characterized by a centralized versus a decentralized management model, where the first one is characterized by centralized decision-making processes and organization of ECDL activities. These profiles emerged, albeit at a different level, with respect to the three dimensions investigated, that is, the organizational, regulatory, and teaching issues. Similar profiles were found also in the previous investigation referring to the year 2003. In particular, a more decentralized

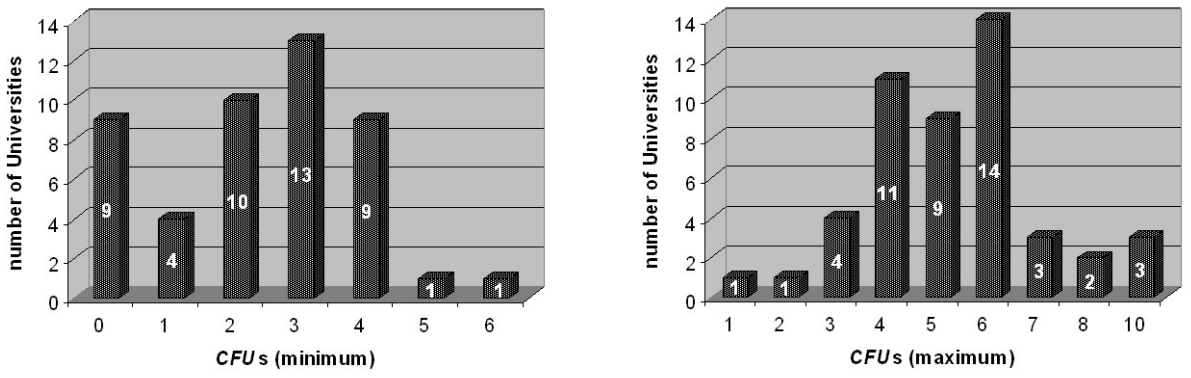

Figure 2 – Distribution of the minimum and maximum number of *CFU*s associated to the ECDL certification.

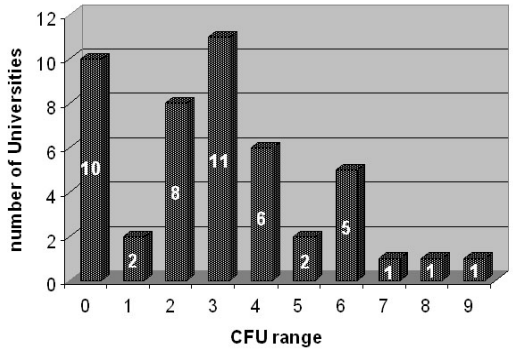

Figure 3 – Distribution of the *CFU*s range.

management structure was prevalent in large Universities, frequently spread over several campuses, with several entities organizing courses and exams, namely, Faculties, Degree Courses, external organizations; on the contrary, small and private Universities usually preferred a centralized approach, with a single teaching and Test Center serving all Faculties.

Focusing on the results for the organizational dimension (Figure 4), the first observation regards two contrasting areas that are separated by the vertical axis. On the right we find Universities with a centralized organization of the ECDL activities and on the left the Universities with mostly decentralized activities. More specifically, the Universities that activated courses at a centralized level nearly always organized in the same way both exams (93% of Universities) and training (86%). On the other hand, the rules regarding the ECDL certification were often defined at a decentralized level. In terms of financing of the teaching and testing activities, it is common across the board to make use of the funds provided by the CampusOne funding scheme but it also emerged that large and polytechnic Universities more frequently recur to direct forms of payment. "CampusOne" was a project (http://www.campusone.it) of the Conference of Rectors of Italian Universities (CRUI) that was launched in the year 2002 to promote the ECDL programme in the Italian Universities and has strongly contributed to the diffusion and the acceptance of the culture of the ICT certifications even beyond ECDL.

As regard to the regulatory dimension, it is worth noting that wherever the certification was obligatory, the ECDL START was required. Rules regarding the ECDL certification were often defined at a decentralized level. Moreover, the number of credits was higher in the Universities where the certification was obligatory.

6. Conclusions

Our monitoring exercise has shown that the majority of the Italian Universities adopted in the year 2004 the ECDL certification to assess the basic computer skills of their students. Moreover, the prevalence of the ECDL START certifications is a demonstration that the Universities considered this type of certification as a "reasonable" first-level approach towards the ICT education.

The teaching organization was characterized by a large variety of choices for what concerns the organization of the courses to teach the ECDL syllabus and the number of hours dedicated to each ECDL

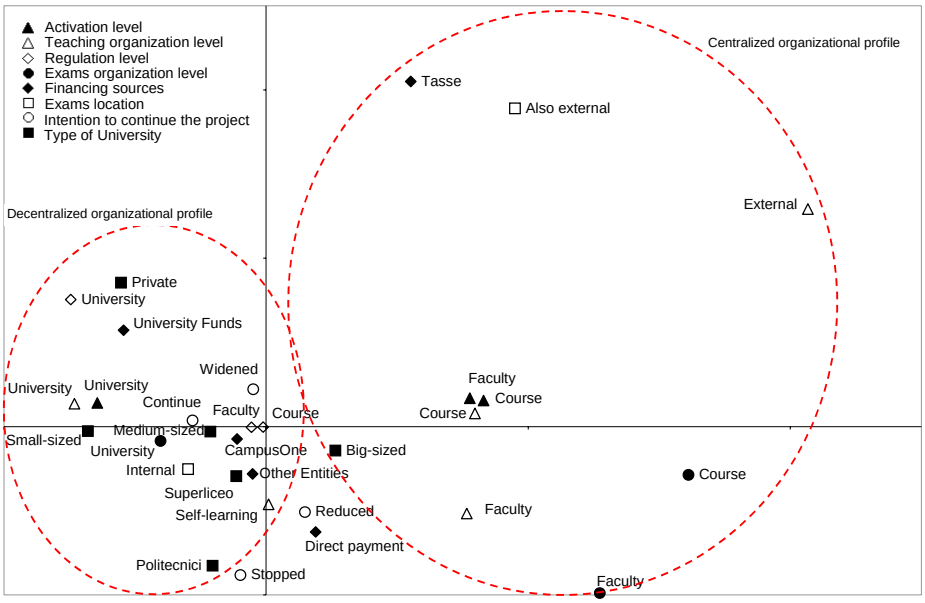

Figure 4 – Correspondence Analysis for characters related to the organization of the ECDL programme.

module. It is interesting to notice the presence in many Universities of tutors to support students during the overall ECDL learning process.

The analysis of the organizational and teaching profiles has shown that the choices operated by the Universities were typically influenced by their size.

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