

# THE ECDL PROGRAMME IN ITALIAN UNIVERSITIES

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## **Abstract**

The European Computer Driving Licence (ECDL) programme aims at testing practical skills and competencies in using ICT tools. This paper presents the results of a monitoring exercise aimed at analyzing the impact of the ECDL programme in the Italian Universities. The ECDL programme, adopted in most Italian Universities since the year 2000, has involved several tens of thousands of students. Our investigation focused on the experiences of the Universities in the year 2003 and, in particular, on the organizational and teaching issues addressed for the implementation of the programme. The analysis has shown that the implementation relied on a large variety of choices about what concerns the teaching organization, the credits awarded to the students and the type of ECDL certification required. These choices varied as a function of the size of the Universities, whereas their geographical location did not seem to have any influence.

*Keywords:* Country-specific developments; Teaching/learning strategies; Evaluation methodologies.

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## 1. Introduction

In the Lisbon summit held in the year 2000, the European governments agreed that *“Businesses and citizens must have access to an inexpensive, world-class communications infrastructure and a wide range of services. Every citizen must be equipped with the skills needed to live and work in this new information society”* [Bulletin EU 3-2000]. Europe is quite large and densely populated by people speaking different languages: thus, the task of equipping every citizen with the skills necessary to live in the information society is very challenging.

The European Computer Driving Licence (ECDL) programme, known outside Europe as the International Computer Driving Licence (ICDL), addresses the problem of establishing a benchmark of basic ICT skills, i.e., skills that every citizen should possess [Stucky, Dixon, Bumann & Oberweis, 2003]. The learning effort required to acquire basic ICT skills – as the ones addressed by ECDL – can be considered an educative goal leading to a massive social improvement [Pfefer, 2002]. A study performed by the Italian ICT professional society AICA (Associazione Italiana per l'Informatica ed il Calcolo Automatico), in collaboration with SDA Bocconi (the School in Business Management of the Bocconi University) has evaluated the social costs due to the lack of ICT skills of the Italian workers [Camussone & Occhini, 2003]. This study showed that in the year 2003 more than 50% of the working population in Italy used a computer for their jobs, even though only 18% have ever had some basic training. The cost for the country of the lack of a widespread ICT education was estimated at approximately 15 billions Euro per year.

Although the ECDL programme is ten years old, and millions of people have already received an ECDL (or ICDL) certificate all over the world, there are few papers studying or even mentioning its impact in Higher Education. In Cole & Kelsey (2004), the ECDL programme is used as a reference standard to define basic skills of nurses and nursing staff. An evaluation of the adequacy of the ICDL for compulsory introductory Information

Technology education at a tertiary education institution in South Africa is presented in Dixie & Wesson (2001). The results of a project for forming University staff for ECDL via e-learning technologies are analyzed in [Lockwood, 2004].

This paper reports the experiences of the Italian Universities for what concerns the introduction and the organization of the ECDL programme. Let us remark that since the year 2001, the Italian Universities have received some specific incentives to adopt the ECDL programme by the “*CampusOne*” project (<http://www.campusone.it>), a funding scheme of the Conference of Rectors of Italian Universities (CRUI).

This paper is based on the activities of the working group, known as, “Observatory of the ECDL programme in Italian Universities”, established in the framework of a cooperation between AICA, CRUI and the Italian ICT Universities Consortium CINI (Consorzio Interuniversitario Nazionale per l'Informatica). Note that the authors of this paper are all members of the working group.

The results reported in this paper refer to a monitoring exercise carried out by the working group in the first semester of the year 2004. The exercise focused on the organization and the outcomes of the ECDL programme in the year 2003. The investigation relies on a web-based questionnaire designed by the authors and sent to the person responsible of the ECDL programme within each of the 72 Italian Universities. The questionnaire was returned by 54 Universities. Among these, 46 Universities had ECDL projects active in the year 2003.

This paper is organized as follows. Section 2 provides some background on the organization of the Italian University system. Section 3 briefly presents the ECDL programme. Section 4 describes the outcomes of our investigation by focusing on the teaching organization adopted by the Universities and on the “credits” awarded to students who obtain the ECDL certification. Section 5 describes the results of the correspondence analysis applied to the data collected by the questionnaires and presents the profiles that characterize the

management of the ECDL programme. Conclusions and future developments are outlined in Section 6.

## **2. The University System in Italy**

The University System in Italy is being completely restructured according to the Bologna pan European agreement dated 1999. This agreement aims at improving and standardizing Higher Education for people all over Europe: in fact, the Bologna agreement should be in place by 2010 all over the European Union.

The goal of this agreement is to eliminate obstacles to the free circulation of people and help them to find jobs, in countries different than their own, consistent with their education. In some sense, the Bologna agreement introduced a sort of “Euro currency” for Higher Education, insofar as it created a single European Educational Space, with three year Bachelor degrees, two additional years for Master degrees, and three years for Ph.D. degrees. This scheme is also known as the “3+2+3 cycle”. Thus, the Bologna agreement is central to the policy of education authorities in the European Union. In fact, since the year 2000, Italy has re-designed almost all University curricula to accommodate the 3+2 structure (the Ph.D. duration was already standardized over three years).

It should be pointed out that this restructuring also introduced the *credit*, as the measurement unit to quantify the learning effort required for students to graduate. In what follows we denote the credit with the acronym *CFU* (Credito Formativo Universitario) to conform to its Italian name. Following the recommendations of the *ECTS* (European Credit Transfer System) a full-time Italian University student is expected to “earn” 60 *CFUs* per year, where each *CFU* corresponds on average to 25 hours of student effort, that is, lectures, exercising, laboratories, and individual study.

It is worth noticing that all three years curricula devote a few *CFUs* to the development of basic computer skills and these *CFUs* have often been associated with the ECDL certification.

### 3. The ECDL programme

The ECDL programme was initially introduced in Finland and then promoted at European level [Carpenter, Dolan, Leahy & Sherwood-Smith, 2000] by CEPIS (Council of European Professional Informatics Societies <http://www.cepis.org>), a federation of 17 national ICT professional associations. CEPIS introduced the ECDL programme in the year 1995 with the support of some EU funding. Currently, the governing body of the programme is the European Computer Driving Licence Foundation (ECDL-F <http://www.ecdl.com>), a not-for-profit organization established by the national ICT professional societies of more than 40 countries.

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

- *internationality*: after the initial experimentation in the European Union, 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.

There are two types of certificate: a START licence (obtained after passing the exams of four out of seven ECDL modules) and a FULL licence (obtained after passing the exams of all seven ECDL modules).

The ECDL programme in Italy is governed by AICA which is also a founding member of CEPIS. AICA first introduced the ECDL certification in Italy in the year 1998: currently more than one million people have been certified in Italy. We point out that AICA includes among its members many University professors of Computer Science and Computer Engineering.

#### **4. Results of the monitoring exercise**

As already pointed out, our investigation refers to the activities performed by the Italian Universities in the year 2003 in the framework of the ECDL programme. The results reported in what follows refer to the 46 Universities that responded to our questionnaire and had ECDL projects active in the year 2003.

##### *4.1 Teaching organization*

The ECDL programme aims at testing practical skills and competencies in using ICT tools, and consists of seven separate modules covering their theory and practice. Different methods can be adopted to teach the modules of the ECDL syllabus, namely, classroom teaching (with the co-presence of teacher and students), self-learning, and blended learning (which combines classroom and self-learning approaches). It should be noted that Universities typically offer multiple ECDL courses, either because of the large number of students following these

courses or because of their heterogeneous skills and background. Hence, different methods can be adopted to teach the courses even within the same University.

Figure 1 shows a 3D representation of the teaching methods adopted by the Universities which participated in our investigation. Each axis represents a teaching method. Larger spheres denote a larger number of Universities. As can be seen, the ECDL courses offered by 17 Universities rely on one teaching method only. In particular, five Universities adopt classroom teaching, four adopt self-learning and eight adopt blended methods only. On the contrary, in the majority of the Universities (27) the courses rely on two or three teaching methods. In particular, all the three teaching methods, namely, classroom teaching as well as self-learning and blended method, are adopted by 10 Universities.

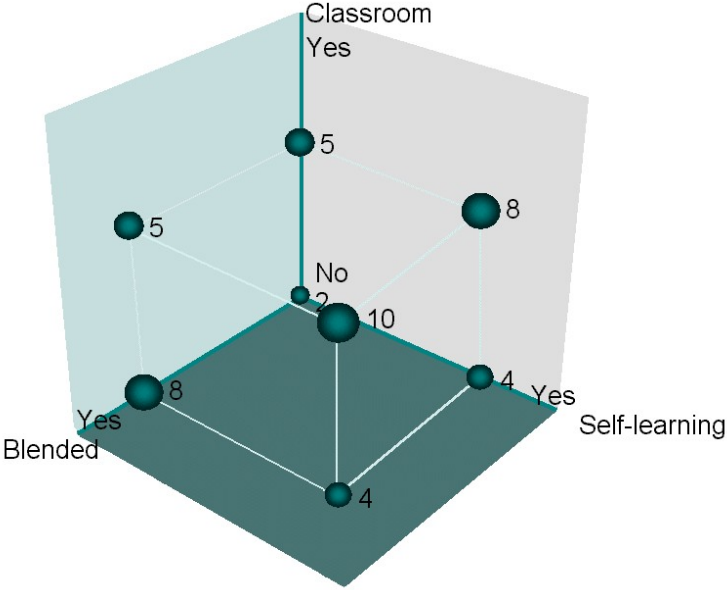


Figure 1 – Methods adopted by Italian Universities to teach ECDL modules.

The classroom teaching method has been further analyzed by focusing on the coverage of the ECDL courses in terms of number of modules and hours taught in the Italian Universities. Classroom teaching is offered by 40 of the 46 Universities that responded to our questionnaire. The analysis showed that a large number of Universities (28 out of 40) offer

courses that cover the syllabus of all seven ECDL modules. Among the Universities offering courses for less than seven modules, there is a group of seven Universities which do not offer either the “*Database*” or “*Presentation*” modules.

On average, the total number of hours dedicated by each University to classroom teaching of the ECDL modules is equal to 49. This value is in line with the international recommendations. Moreover, we have noticed that the number of hours dedicated by each University to the different ECDL modules is characterized by a small dispersion. In particular, we have identified a group of 16 Universities that do not differentiate among modules, that is, they dedicate the same number of hours to every ECDL module.

Table 1 presents some descriptive statistics on the number of hours taught for each of the seven ECDL modules. As can be seen, the mean values do not exceed 10, even though there are Universities that offer courses whose duration is equal to 40 hours. It is interesting to point out that the standard deviation of the number of hours of each module is always smaller than the corresponding mean. This means that the values making up each distribution are characterized by a small dispersion. Moreover, as the median is also smaller than the corresponding mean, we can conclude that the distributions are positively skewed. We can also see that the mode (i.e., the number of hours with the highest frequency, that is, the most common duration of ECDL courses) is equal to 8 for the majority of the distributions.

Another interesting issue considered in our investigation was the learning environment available during the ECDL classroom courses for what concerns the “hands on” practice. In particular, we focused on the availability of tutors and equipment in the laboratories. We have noticed that tutors are employed by 19 Universities. Moreover, 18 Universities employ tutors also to help students throughout their whole learning process.



<b>ECDL modules</b>	<b>Mean</b>	<b>St. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Mode</b>	<b>Median</b>
Basic Concepts of Information Technology	9.1	8.5	1	40	4, 6, 8	6.5
Using the Computer and Managing Files	7.6	5.8	1	30	8	6
Word Processing	8.7	5.7	1	30	6	7
Spreadsheets	9.2	6.4	1	35	8	8
Database	10.0	7.7	1	40	8	8
Presentation	7.4	5.5	1	30	8	6
Information and Communication	7.6	5.2	1	25	6, 8	6.5

Table 1 – Descriptive statistics of the number of hours taught for each ECDL module.

In terms of equipment, all Universities have set up laboratories with PCs that are used for the ECDL practice. In particular, 27 Universities offer a one-to-one correspondence between students and PCs, whereas in the laboratories of 10 Universities, each student has to share a PC with one colleague during the ECDL practice.

As already pointed out, most Universities combine and integrate classroom teaching with self-learning methods. In our investigation, the self-learning process has been analyzed with respect to the learning resources made available to the students. We have considered the case of Universities using multiple learning resources. On-line and off-line multimedia and printed-based materials are typically used in combination. Our investigation has revealed a tendency to use materials available on the market, even though there are Universities that have developed their own materials. Moreover, the choice of off-line materials is slightly prevalent, as to allow students to use the materials without the need for an Internet connection.

Another aspect considered in the analysis deals with the ECDL certification. Students take the tests required to obtain the ECDL certification at their own Universities. Indeed, the large majority of the Universities (87%) are accredited ECDL Test Centers.

Finally, it is worth noticing that Universities do not typically assign any grade to the ECDL certification: students are simply awarded the corresponding *CFUs* regardless of their performance during the ECDL test.

#### 4.2 Credits

Another important aspect of the ECDL programme considered in our investigation deals with how the ECDL certification has been interpreted in the various University curricula, in particular, with respect to the number of *CFUs* awarded to the students once they acquired the ECDL certification or when they already had an ECDL certification.

To avoid any limitation to the autonomy of the Universities in terms of design of their curricula and definition of credits, the ECDL programme did not specify the number of *CFUs* corresponding to the ECDL certification. As a result, the Italian Universities made very different choices, as shown by Figure 2 and Figure 3, which present the minimum and maximum number of *CFUs* associated with ECDL certification by the 46 Universities that took part of our monitoring exercise. The diagrams also show the distribution of the number of *CFUs* as a function of the type of certification selected by Universities: ECDL FULL certification for all curricula, ECDL START certification for all curricula or “mixed”, that is, the type of certification (FULL or START) varied across curricula.

The number of *CFUs* awarded to the ECDL certification (ranging from 0 to 12) clearly shows the lack of any reference agreement among the Universities. This implies that the mechanism for supporting student mobility across Universities needs some improvement. The average number of *CFUs* assigned by Universities that award at least one credit to the ECDL certification could be a possible basis to establish a common reference point. The distributions shown in Figure 2 and Figure 3 are characterized by a mean value of 2.8 and 5.45, respectively. Moreover, the mode of these distributions is equal to 2 and 6, respectively. This range of values seems a reasonable reference for the ECDL certification. We do suggest a

range as opposed to a single value as each individual curriculum could offer other activities overlapping or complementing the ECDL programme.

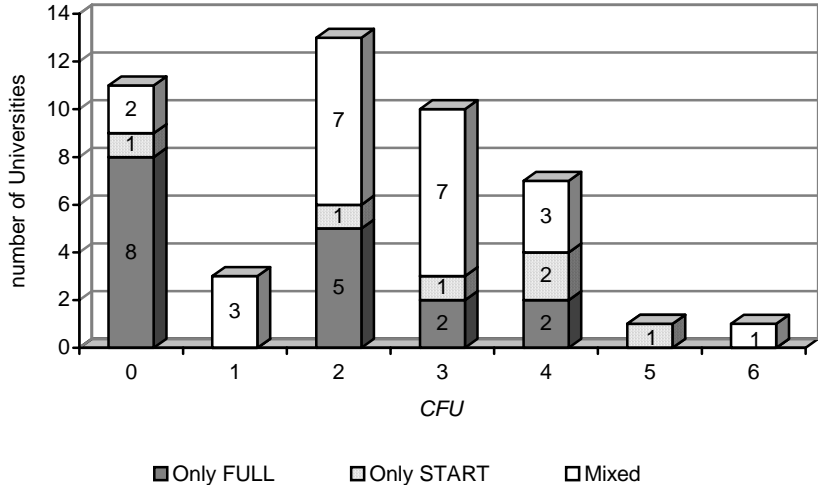


Figure 2 – Distribution of the minimum number of *CFUs* awarded to the ECDL certification together with their breakdown as a function of the type of certification.

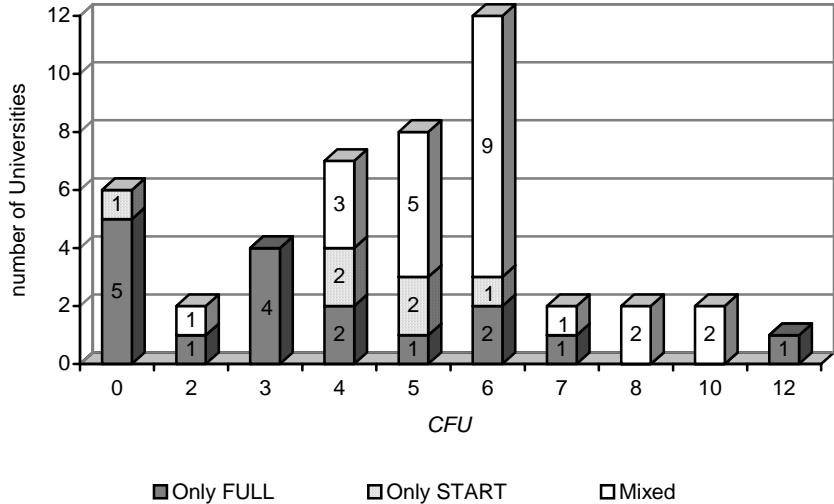


Figure 3 – Distribution of the maximum number of *CFUs* awarded to the ECDL certification together with their breakdown as a function of the type of certification.

Further consideration was given to Universities that assign zero *CFU* to the ECDL certification. As can be seen, for 11 Universities zero is the minimum number of *CFUs* associated with the ECDL certification. This means that the ECDL skills are considered as

pre-requisites for the corresponding academic programme. Moreover, for six Universities zero is the maximum number of *CFUs* associated to the ECDL certification. In perspective, this choice seems the most appropriate for two reasons: the level of competence certified by the ECDL programme is actually very basic and, in the near future, these ICT skills would be presumably considered as a pre-requisite for accessing any academic programme.

More insights into the criteria adopted to quantify the numbers of *CFUs* associated with ECDL certification can be obtained by relating these numbers with the type of certification adopted by the Universities. We have identified three categories of Universities: the Universities that adopted the ECDL FULL certification for all their curricula, the Universities that adopted the ECDL START certification for all their curricula, and Universities that adopted a “mixed” solution, that is, a few of their curricula required the ECDL FULL certification and a few the ECDL START certification. Figure 2 and Figure 3 present the breakdown of the minimum and maximum number of *CFUs* as a function of the type of ECDL certification required by the Universities. These breakdowns show some expected outcomes, that is, the largest numbers of *CFUs* are assigned by Universities that select the FULL or “mixed” certification. We can also see a quite surprising result, that is, Universities adopting the START certification (consisting of four ECDL exams) award a larger number of *CFUs* than the Universities adopting the FULL certification (consisting of seven ECDL exams). On average, the maximum numbers of *CFUs* awarded to the START and FULL certifications are equal to 4 and 3.41 respectively. This discrepancy is far more evident for the minimum numbers of *CFUs*, whose corresponding values are equal to 3 and 1.41 respectively. This phenomenon could be explained and justified by the different approaches followed by the Universities that adopt the FULL or START certification. Wherever students are requested to pass all the seven exams, the skills and competencies of ICT tools assessed by ECDL certification are more likely to be considered as a pre-requisite (therefore deserving less credits), whereas Universities that select four specific ECDL modules are more oriented

towards considering the corresponding skills as the arrival point for a dedicated teaching activity (thus deserving more credits). In any case, our analysis has clearly shown the need for better coordination among Universities to avoid situations in which students passing four ECDL exams earn more *CFUs* than students passing all seven exams.

Another view of the same data can be obtained by analyzing the *CFUs* as a function of the year of introduction of the ECDL programme. The results presented in Figure 4 and Figure 5 show the tendency of the Universities that introduced the ECDL programme earlier to associate a larger number of *CFUs* to the certification. Indeed, in the early days of the ECDL programme, the concept of certification was not customary for Universities, and to facilitate its acceptance the number of *CFUs* was used as an incentive.

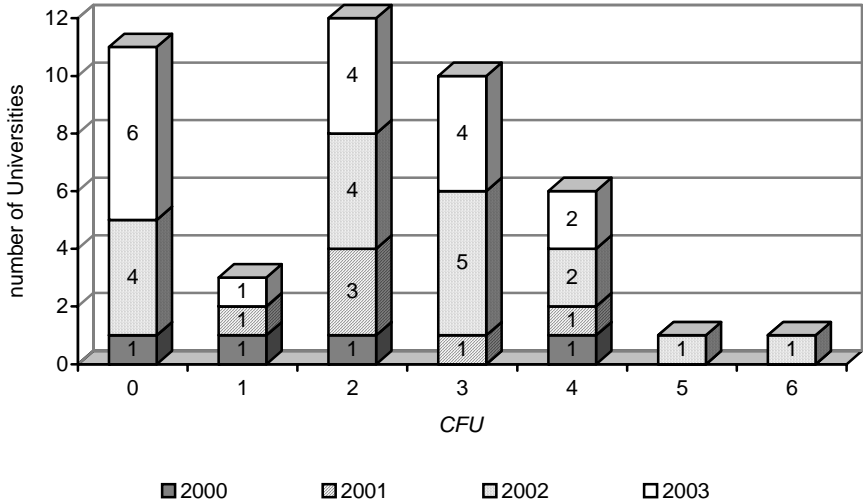


Figure 4 – Distribution of the minimum number of *CFUs* awarded to the ECDL certification as a function of the year of introduction of the ECDL programme.

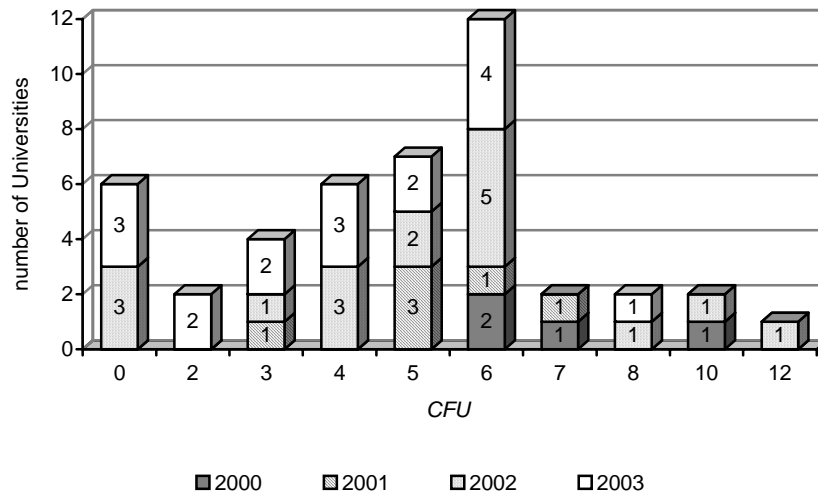


Figure 5 – Distribution of the maximum number of *CFUs* awarded to the ECDL certification as a function of the year of introduction of the ECDL programme.

### 4.3 Quantitative results

This section is devoted to an outline of some quantitative data on the ECDL programme in the year 2003. The number of ECDL exams passed in University Test Centers was equal to 98,849. This number, that accounts for 15% of the total number of ECDL exams (641,884) passed all over Italy, gives a clear picture of the role of the ECDL programme within the Universities. A second important outcome deals with the type of ECDL certification adopted by the Universities. The majority (83%) of the 12,955 ECDL START certificates released in the year 2003 in Italy were issued by Universities. On the contrary, the majority of the ECDL certificates released outside Universities were for FULL certification. The number of ECDL FULL certificates released by Universities was quite low, only 8,029 (8%) of the overall number of ECDL FULL certificates (102,984). These numbers show a strong prevalence for ECDL START certificates within Universities and indicate that the ECDL START certificate is considered by Universities to be a “reasonable” first-level approach to ICT education.

Our study has also focused on the analysis of the number of ECDL certificates released in Italy in the year 2003 as a function of the age of their recipients. We considered ages ranging

from 15 up to 30 to analyze the effects of the ECDL programme in pre-academic years (i.e., 15-19) corresponding to high schools as well as in post-academic years (i.e., 23 and higher). Figure 6 shows the distribution of the number of ECDL FULL certificates as a function of the age of their recipients. The largest number of certificates (12,867) has been awarded to 18 years old recipients, even though we can observe high peaks corresponding to 19 and 20 years old recipients. By looking at the height of these peaks we can see that the number of ECDL FULL certificates awarded to 20 and 21 years old recipients is much larger than the overall number of certificates awarded within Universities. This result witnesses the large diffusion of the ECDL certification outside Universities.

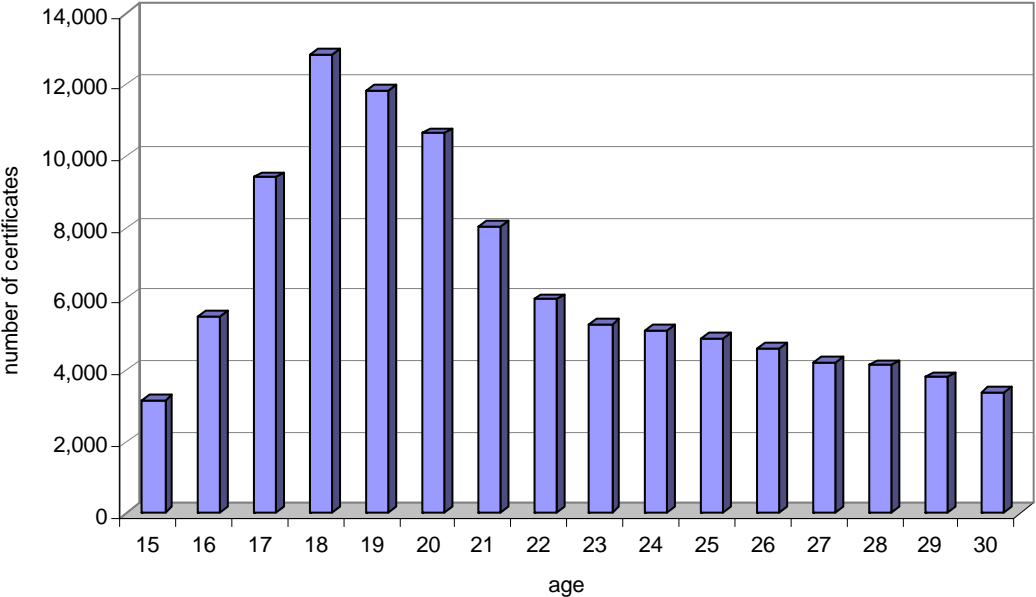


Figure 6 – Age distribution of the ECDL FULL certificates awarded in the year 2003.

**5. Organizational and teaching profiles**

To identify profiles that characterize the management of the ECDL programme in Italian Universities we applied Correspondence Analysis (CA) [Greenacre, 1984, 1993]. This technique is used to study the relationships between modalities (or categories) of two or more discrete variables (usually qualitative). The aim of CA is to highlight the structure of the

associations among these variables (or characters) whose modalities and frequencies are reorganised into contingency tables that often have a complex structure and tend to distort – or even hide - essential relationships. Correspondence Analysis allows the visualization of these relationships in terms of points in a space that is smaller than the original one, thus greatly facilitating their interpretation. Modalities with strong associations are represented as points close to each other in the subspace produced by the Correspondence Analysis, while the points corresponding to loosely associated or non-associated modalities are further apart.

In our monitoring exercise, the analysis was undertaken in three dimensions, analyzing separately the organizational, regulatory, and teaching issues. These areas were integrated with two additional areas used as supplementary variables for the analysis, namely, the geographic zone (Northern, Central, Southern) and the type of University (large, medium or small size, “superlicei”, polytechnic, private<sup>†</sup>) as defined in a report published by Censis [Censis, 2004]. In general terms, for all three dimensions – organizational, regulatory, teaching – no significant differences emerged with respect to the geographic zone, unlike the findings of a similar analysis carried out in the year 2002 [Calzarossa, Ciancarini, Maresca, Mich & Scarabottolo, 2004]. Significant differences emerged with respect to the type of University: in large Universities, frequently spread over several campuses, a more decentralized management structure was prevalent, with several entities organising courses and exams; on the contrary, small and private Universities usually preferred a centralized approach, with a single teaching and Test Center serving all faculties.

### *5.1 Organization*

Figure 7 shows the diagram produced with the CA for characters pertaining to the dimension deemed “organization.” The first observation regards two contrasting areas that are

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<sup>†</sup> Large Universities have more than 40,000 students; medium-size Universities range from 20,000 to 40,000 students; small Universities range from 10,000 to 20,000 students; “superlicei” are Universities with less than 10,000 students; polytechnics only offer courses in engineering and architecture.



separated by the vertical axis. On the right we find Universities with a centralized organization of ECDL activities and on the left the Universities with decentralized activities. We can also see that the points for the centralized group of Universities are plotted more closely together due to greater homogeneity within the group. More specifically, the Universities that activate courses at a centralized level nearly always organize in the same way both exams (93% of cases) and training (86%). Worth noting is that these Universities also use the self-learning method less frequently (65% do not use it at all). As for the type of University, private Universities best correspond to this profile. In terms of financing, it is common across the board to make use of the funds provided by the *CampusOne* funding scheme.

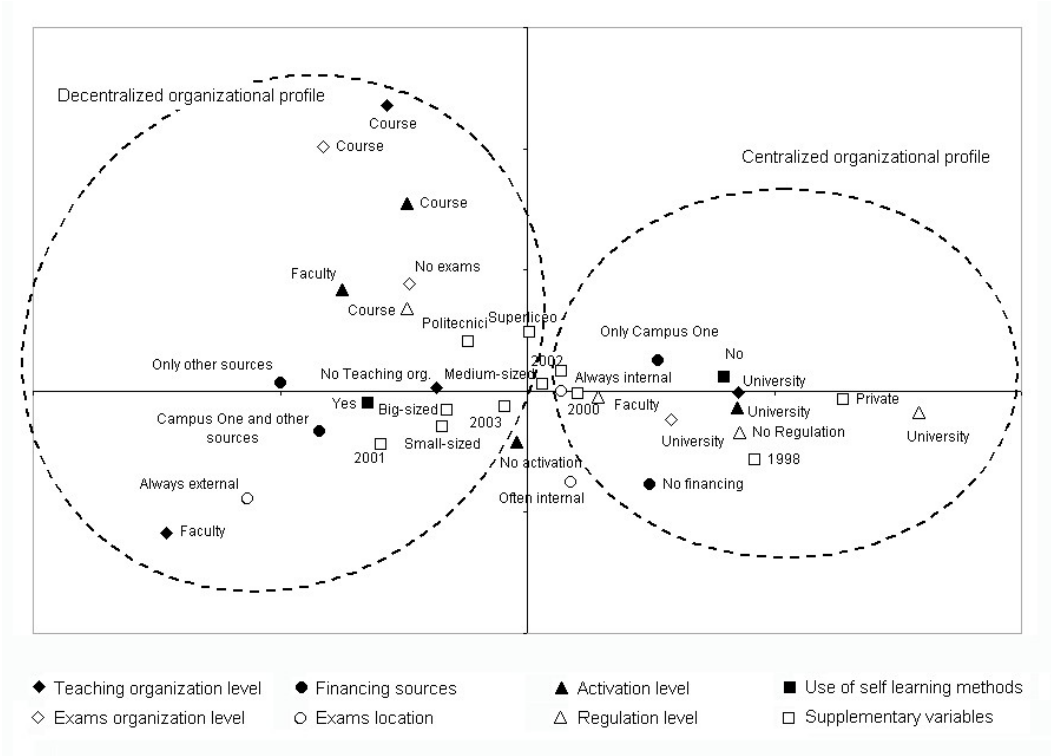


Figure 7 – Correspondence Analysis for characters related to the organization of the ECDL programme.

Moreover, CA reveals that the Universities that introduced earlier the ECDL programme chose a centralized management model; 83% of the Universities that started the programme before the year 2001 have a centralized organization.

For Universities showing a decentralized organizational profile, the situation is less defined; both regulations and organization of courses are often managed at different structural levels. Moreover, they tend to use external Test Centers for the ECDL exams.

## 5.2 Regulations

The analysis of this dimension can start with some marginal points shown in Figure 8, which represent few Universities but reveal some interesting associations. In the lower right-hand quadrant, there is a group of Universities (mostly public and of small or medium size) that do not assign any *CFU* to the ECDL certification and require the ECDL FULL certification. In the upper right quadrant, we find the Universities that require the ECDL START certification. These Universities tend to design and administer regulations at a centralized level (50%). Private Universities are most common in this profile.

Certification is often obligatory in large Universities (80% of large Universities), where rules regarding ECDL certification are often defined at a decentralized level. Moreover, the number of *CFUs* is higher in Universities where certification is obligatory. Finally, it is worth noting that the structure of the data shown in Figure 8 does not highlight any specific regulation profile.

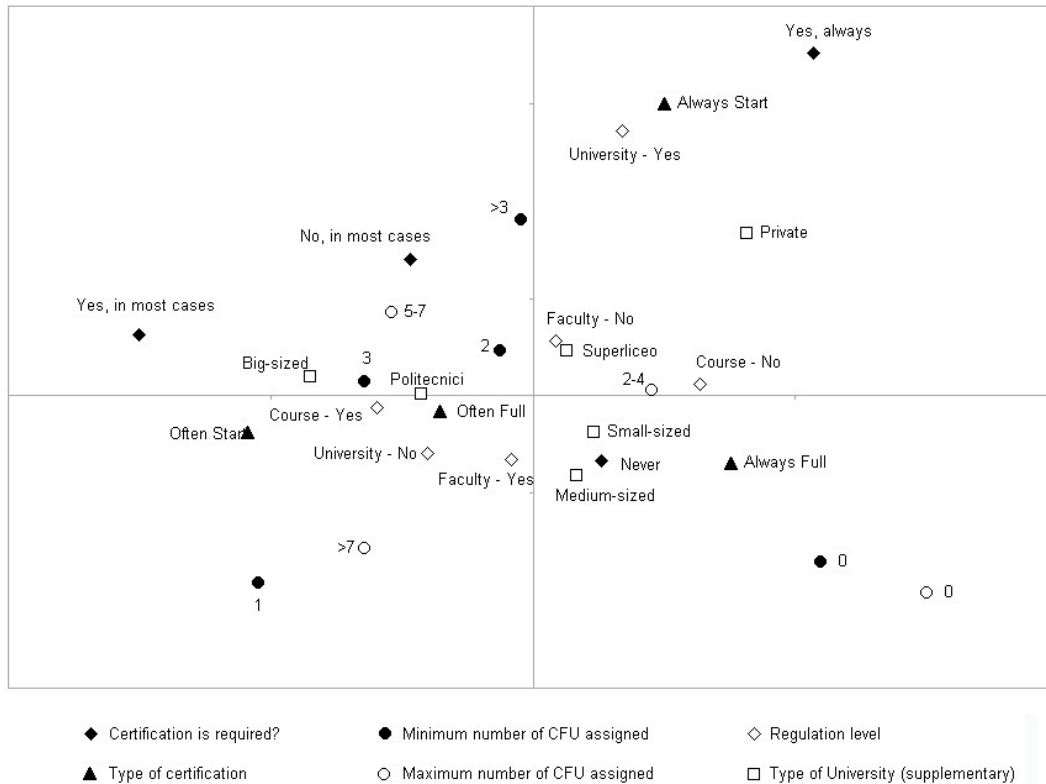


Figure 8 – Correspondence Analysis for characters related to regulations adopted for the ECDL programme.

### 5.3 Teaching

The CA conducted on issues related to the methods adopted to teach the ECDL modules by the Universities that offer internal training did not reveal any clearly identifiable profile (see Figure 9). Nevertheless, there are some associations worth noting. The first observation deals with the tags that are located on the right-hand side of Figure 9, which represent Universities where the ECDL training takes place for four or five of the seven ECDL modules. With respect to Universities offering training for all seven modules, these Universities are often characterized by one type of teaching method (blended or classroom only); in fact, while 80% of the Universities that organize courses for all seven modules use at least two teaching methods, 67% of the Universities covering five modules rely exclusively on a blended method, and 50% of the Universities covering four modules use only a classroom method.

On the left-hand side of the diagram, we find the Universities where training is only based on self-learning methods or on a combination of self-learning and blended methods. In these Universities, students are often assisted by tutors.

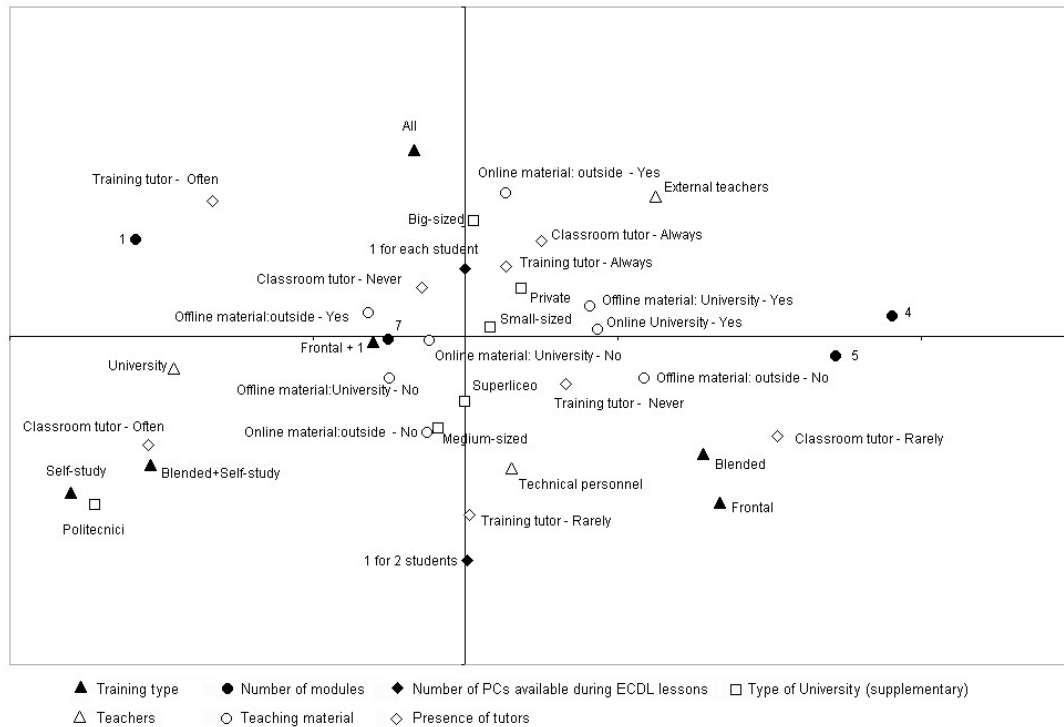


Figure 9 – Correspondence Analysis for characters related to the teaching of the ECDL modules.

The 44% of large Universities use all three types of teaching methods (i.e., classroom, self-learning, and blended) because they typically offer several different courses. Moreover, in large Universities and private Universities, it is very likely that students will have a PC available during ECDL lessons (88% and 100%, respectively), while this happens less frequently (44% of cases) in medium-sized Universities.

Some observations can also be made about the teaching materials used for the ECDL training. In general, Universities which do not publish off-line teaching materials tend to have no on-line materials either. In these cases, it is very common to exploit off-line materials

produced by external sources (88%). Small Universities produce off-line materials more often (62%), while private Universities usually adopt on-line support materials (60%).

Similar considerations can be drawn for the presence of tutors, both in classroom and throughout the whole learning process. Wherever the first type of tutoring is found, the other is more likely to be present also. Among the Universities analyzed in our investigation, private and large Universities make the greatest use of tutors.

## **6. Conclusions**

ECDL testing is the means chosen by the Italian Universities to assess basic computer skills. The monitoring exercise carried out in the year 2004 has shown wide spread adoption of the ECDL programme in Italian Universities. Our analysis has demonstrated that the implementation of the programme relies on a large variety of choices about what concerns the teaching organization, the credits awarded to the students and the type of ECDL certification required. Universities typically offer multiple ECDL courses because of the large number of students and of their different skills and background. Courses differ in terms of teaching methods, number of ECDL modules and hours taught per module. Moreover, they vary as a function of the size of the University and of its geographical location. On average, each University dedicates 49 hours to classroom teaching of ECDL modules. The number of *CFUs* awarded by Universities to the ECDL certification is characterized by a wide range of values (from 0 to 12). This lack of a reference agreement among Universities should be overcome. The analysis has also shown that the majority of the ECDL certificates awarded by the Universities in the year 2003 refer to the START licence. This means that the ECDL START is considered by the Universities to be a “reasonable” first-level approach to ICT education.

It is important to point out the key role played by CRUI with its *CampusOne* funding scheme in the promotion of the ECDL programme. Even through there are Universities that introduced the ECDL programme in the year 2001 or earlier, the majority of the Universities

adopted the ECDL certification in the year 2002 and 2003, when the *CampusOne* initiative was launched. It is worth noting that CRUI and the *CampusOne* project have strongly contributed to the diffusion and the acceptance of the culture of the ICT certifications even beyond ECDL.

In future, we plan to extend our evaluation to advanced proprietary and non-proprietary ICT certifications, such as, Cisco, Microsoft, ECDL Advanced, EUCIP, and on their role within Italian Universities.

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