Higher Education and Students with Disabilities: e-Learning for Inclusion at eCampus University

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Abstract. The aim of this work is to describe how eCampus University provides students with disabilities with a flexible e-learning environment that favours inclusion and supports self-determination and empowerment. The article describes some features of the eCampus organizational model that allow for individualized teaching assistance through an extensive network of tutors around Italy; the eCampus VLE offers a broad range of tools that flexibly adapt to special learner needs. Subsequently, an aggregated outline is provided of the students with disability at eCampus, based on the analysis of data collected in the 2014–2018 academic years; the analysis takes into account various aspects, such as gender, Faculty, type of disability, aids and supports, degree of satisfaction. Special attention is paid to the adoption of personalized supporting measures, with reference to various categories of tutorship, the adaptation of examination formats, compensatory tools, and dispensatory measures. Some conclusions can be drawn from these data, and from a variety of suggestions from students, which will be useful to improve the quality of services offered to students with disabilities.

Keywords: Students with disability · Learning disabilities · Inclusion · Online learning environment · Higher education

1 Introduction

In order to cope with the increased number of students with a disability or a learning difficulty, universities strive to implement measures to support academic success and inclusion also for students characterized by special learning needs [1, 2].

Compared to peers without disabilities, students with disabilities and with Specific Learning Disabilities reported difficulty with assignments and had more physical, technological, systemic, financial, or attitudinal problems [3, 4]. The role of the institutions is fundamental in facilitating inclusive opportunities for these students, as well as in minimizing the impacts of factors that might hinder those opportunities [5, 6].

E-learning can be an effective educational approach for people with disabilities as a means to acquire self-determination and empowerment. This can happen thanks to

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flexibility, interactivity, and the customization of a learning pathway. E-learning is also incisive because of its ability to get rid of time-space constraints [7].

The e-learning policy paper for social inclusion, written within the framework of the e-learning action plan of the European Commission makes the education policy of the European Union clear as a further acknowledgment of e-learning as a key point for social inclusion.

2 Features of the eCampus Organizational Model and Tools

Technologies are not the only enabling factor for the transformation of industrial and manufacturing industries into Industry 4.0: people represent, in fact, a fundamental resource for the adoption of the new digital paradigms and the achievement of the expected outcomes. Nonetheless, companies are facing difficulties in finding candidates with updated skills and ready for employment. In this sense, the academic curricula of eCampus University are market oriented. The needs and the interests of the students are always cared about, by offering them real perspectives of professional and human growth. For this reason, eCampus University proposes degree courses and high-level Master degrees that give the students all the required skills and ensure them integration, with the final objective of training new specialists for the actual world. All eCampus courses are fully offered online, together with professional and classroom-based teaching.

As well as its headquarters, eCampus University is present throughout the country: not only can the courses it offers be taken from anywhere at any time, but it also possesses an extensive network of tutors around Italy, who offer individualized teaching support and advice to students. These are clear advantages for students with special needs, who can get support locally and are not required to travel long distances to undergo exams.

Given the framework described above, the eCampus Virtual Learning Environment (VLE) offers a number of services and tools to support students with disabilities. In the following, we will highlight specific features of the eCampus eLearning platform and of the underlying organizational model that support particular learner needs and improve the learning processes.

In the general architecture of VLE platforms proposed in [8] the highest layer, namely the application-specific one, identifies the functions representing users, courses and didactic resources:

- user profile management, including students portfolios and grades, system usage statistics, working groups, assignments and so on;
- course management: creation, customization, administration and monitoring of courses;
- educational resource delivery: tracking of learning material usage, assessment results;
- administrative management: registration, authentication, student records and logs, access rights, views, etc.;
- learner support: private and shared annotation spaces, bookmarks, notepads, statistics, recommendations, help-desk.

These are the software components learners mostly interact with, and the context where services and tools to support students with disabilities are to be located.

The eCampus VLE features a broad range of functions, some of which are particularly interesting from the perspective of adaptation to special learner needs:

- **Software and tools for hearing and speech impaired students**: speech synthesis and recognition, browser extensions to improve the accessibility features of the platform.
- **Lessons**: the learning resources consist of lessons and study sessions based on slides, digital documents and videos. All the interactions between the learner and the resources are tracked, in conformity with the SCORM Runtime Environment specifications.
- **Tests**: formative and summative evaluation of the learner's progresses are carried out online, and the results are recorded in the learner's profile.
- **Monitoring tools**: besides lesson and test delivery, all learners' online activities are tracked, including login and logout to the platform, document up-and down-load, contributions to asynchronous (forums) and synchronous (chat) communication and sharing channels.
- **E-portfolios**: exam results, essays and other student-produced material.
- **E-tivities**: concept maps, wikis and other collaborative and cooperative tools.

All these functions produce a large amount of data that can be handled by both predictive and descriptive models: this is particularly relevant to provide suggestions, recommendations and indications to learners with special needs.

3 Sample Description

The descriptive/interpretive analysis below aims to provide an outline of the students with disability population at eCampus online university. In particular, the expression "student with disability" referred to the Article 3 of the Italian law number 104/92 ("Framework Law for assistance, social integration and rights of the handicapped"), that defined an "handicapped person" (the outdated term used to identify a person with disability[1]) as someone "having a permanent or a progressive physical, mental or sensory impairment that determines difficulties in learning, social relations and work integration, in such a way as to determine a process of social disadvantage or marginalization". Instead, the expression "students with learning disability" referred to the Italian Law number 170/2010 that has recognised dyslexia, dysgraphia, dysorthography and dyscalculia as Specific Learning Disabilities (Disturbi Specifici dell'Apprendimento, DSA), that are associated to adequate learning abilities, without sensory or neurological deficit.

When students with disabilities or with learning disability enrol at the eCampus University, they are required to fill in a data form specifying the type of disability and the aids and tools required. The eCampus University disability and learning disabilities

[1] It is only since the introduction of the UN Convention on the Rights of Persons with Disabilities, approved by the United Nations in 2006 and ratified in Italy in 2009 by a low, that the used of the expression "persons with disabilities" became mandatory.

office collected the data below during 2014-2018 academic years, and treated them anonymously in compliance with the Italian privacy legislation. Students accessing the service increased from 8 in 2014 to 95 in 2018.

During the considered period, a total of 290 students accessed the service, 158 females (54.48%) and 132 males (45.52%). 147 (50.69%) of them were psychology students, 46 (15.86%) literature and philosophy students, 41 (14.14%) law students, 34 (11.73%) engineering students, and 18 (6.21%) economics students (see Figs. 1 and 2).

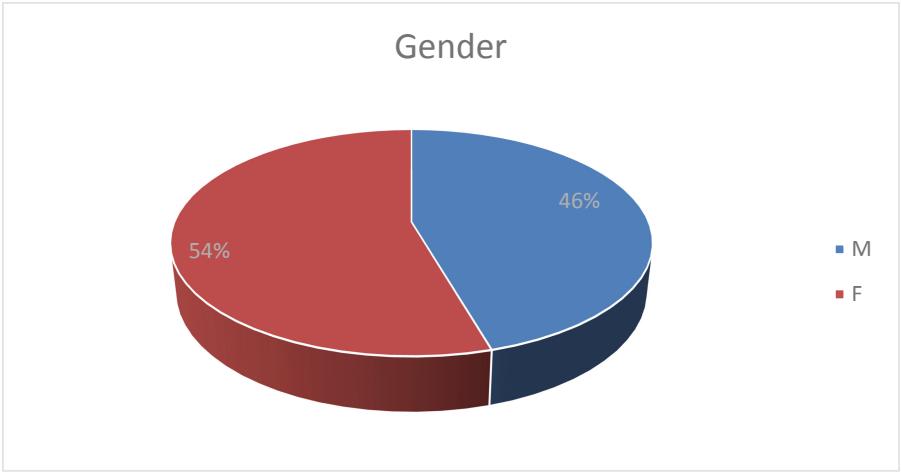

Fig. 1. The sample characterization: gender

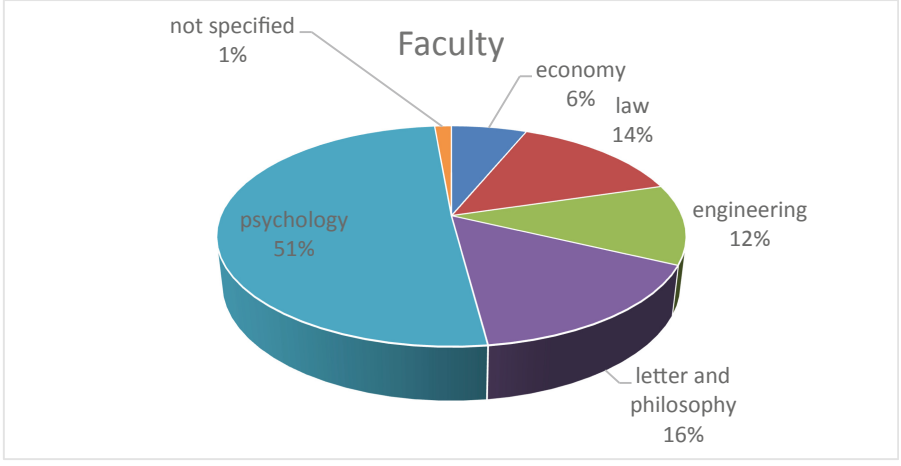

Fig. 2. The sample characterization: Faculty

Subjects were grouped according to the type of disability into: students with disability ("permanent or a progressive physical, mental or sensory impairment", Law 104/1992) and specific learning disorder students (dyslexia, dysgraphia, dysorthographia and dyscalculia). 156 (53.79%) were specific learning disorder students; in particular, 114 (40.14%) were characterized by a comorbidity between at least two learning disorders (e.g. dyslexia and dyscalculia); 13 (4.58%) were students with a diagnosis of dyslexia, 8 (2.82%) of dyscalculia, 6 (2.11%) of learning disorder not otherwise specified and 2 (0.70%) with dysgraphia. The others 134 (46.21%) were classified as students with disabilities. About 27% of these students suffer from neurological problems, about 10% experience sensorial impairments (visual or hearing problems), 4% have mental impairment, 3% have psychic problems (schizophrenia, anxiety disorders), another 2% suffer from autism or behavioural problems, and the rest have other medical problems or other rare or complex conditions (see Figs. 3, 4, and 5).

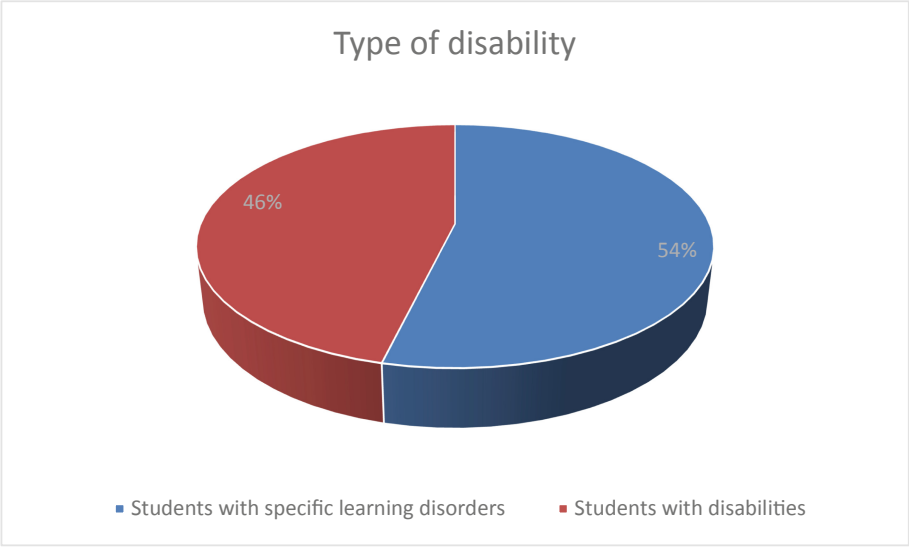

Fig. 3. The sample characterization: type of disability

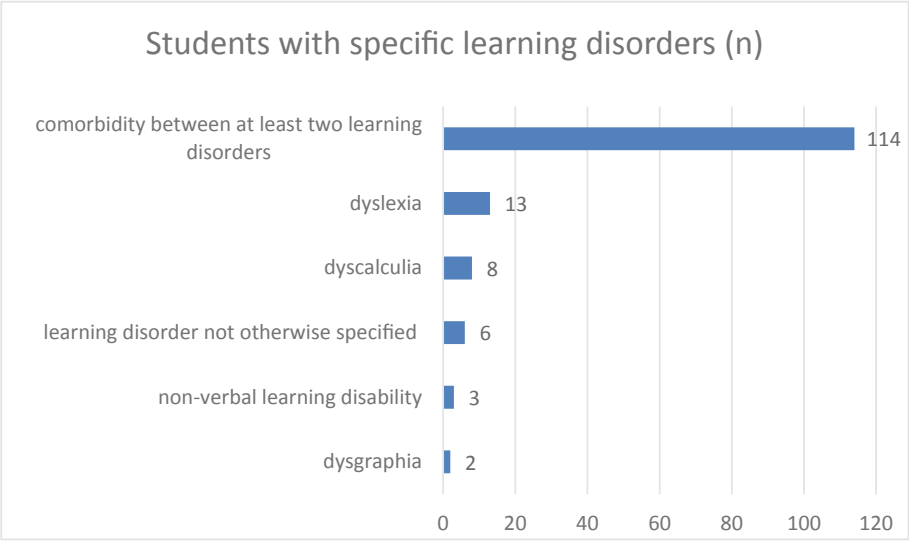

Fig. 4. The sample characterization: type of specific learning disorders

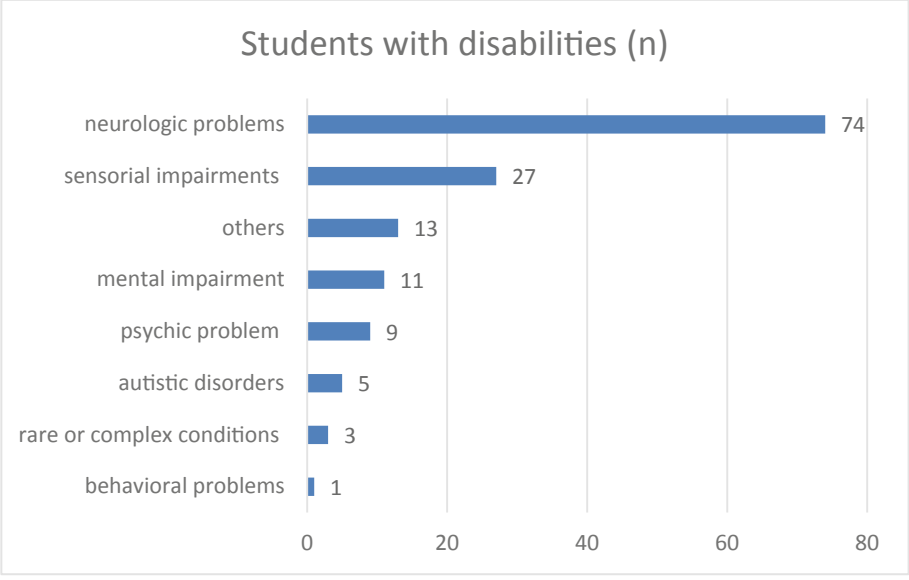

Fig. 5. The sample characterization: type of disability

To have examinations adapted to their needs, students with disability or learning disabilities may require aids and supports. The descriptive analysis (see Figs. 6 and 7) provided an overall view of the support required by students, and took into consideration the following elements:

- the categories of tutorship (for writing, for reading, accompanying tutor),
- the adaptation of the examination format (extra time, enlargement of the text in the written assignment),
- compensatory tools (oral integration written note, use of the computer for writing the task, evaluation of the contents produced without taking into account any spelling and grammatical errors present in the paper, calculator use, conceptual maps, forms),
- dispensatory measures (only oral exam, no listening test for English exam).

Data suggested that students with learning disabilities are more likely to receive compensatory tools, especially the permission to use conceptual maps during the exam. For what concern students with disability, adaptation of examination (extra time) is the aid they received most frequently.

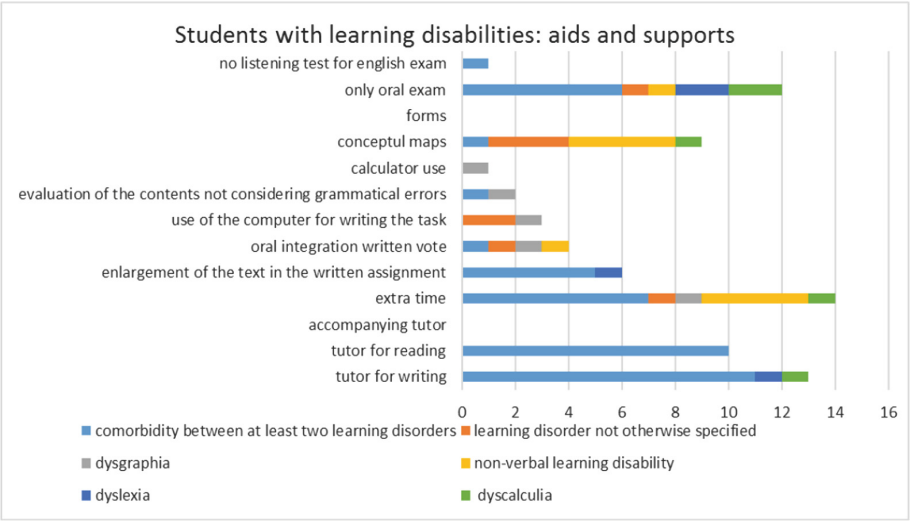

Fig. 6. Distribution of aids and supports by type of learning disabilities

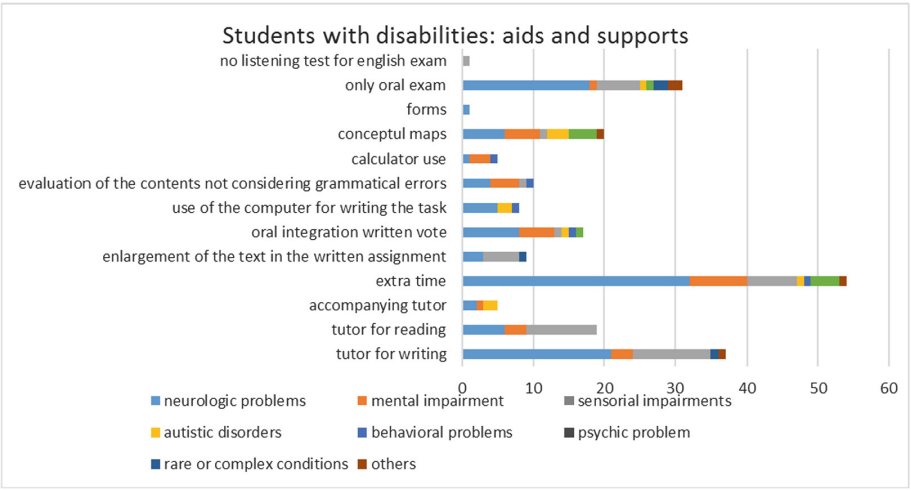

Fig. 7. Distribution of aids and supports by type of disability

4 Satisfaction Survey

In order to investigate the experience and the degree of satisfaction of students with disabilities and learning disabilities about the services received, an anonymous questionnaire was given to all these students enrolled in the current academic year (from 1st August 2018). Only 24 students filled in the questionnaire; 13 (54.2%) of them were female, with an average age of 24,4 years (range 18–45); 50% were enrolled in an undergraduate eCampus University course. 70.8% (N = 17) are students with learning disabilities, and 29.2% (N = 7) are students with disabilities.

With regard to their degree of satisfaction about the service offered by the University (see Fig. 8), 9 students (37.5%) replied that they were satisfied enough, 7 (29.2%) very satisfied, whereas 5 a little satisfied (20.8%) and 3 (12,5%) not at all. Moreover, we also asked the students how adequate and functional they evaluate the tools for conducting the exams in relation to their needs (see Fig. 9). 70.9% (N = 17) students are rather or very satisfied, and only 7 students are not satisfied (29,2%). These unsatisfied students mainly complained about some aspects related to the way they study (i.e. "I think, a simplification of the concepts we have to study is needed"), not so much about the tools available to them to take the exam.

Other questions aimed at the evaluation of specific tools of study. Most of the students (83.3%; N = 20) reported that the online university model is functional for their needs (see Fig. 10); 21 (87.6%) declared that learning materials can be used without difficulty ("usability/availability"); most students (70.8%; N = 17) consulted believe that the exercises proposed by the University courses are already structured in a functional way with respect to their difficulties. Furthermore, students believe that the tools to contact teachers (the electronic mail system and the virtual office) are helpful in consideration of their needs. Finally, some students provide suggestions in order to improve the university service. In particular, their attention is focused on the

simplification of the online study platform offered by the university; students also highlight the need for an increase of teachers' sensitivity and awareness towards disability and suggest that teachers should undergo specific training on how to support learners with disabilities.

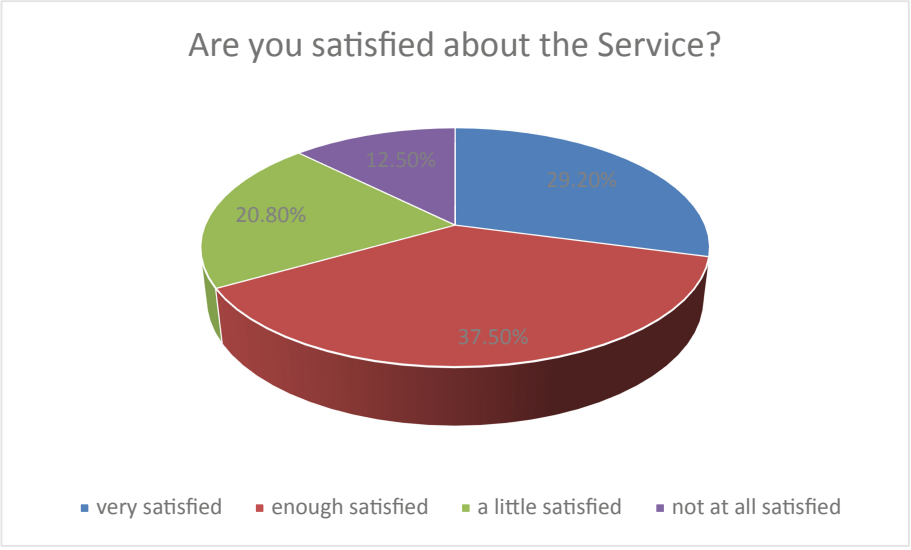

Fig. 8. Degree of satisfaction about the service offered by the University

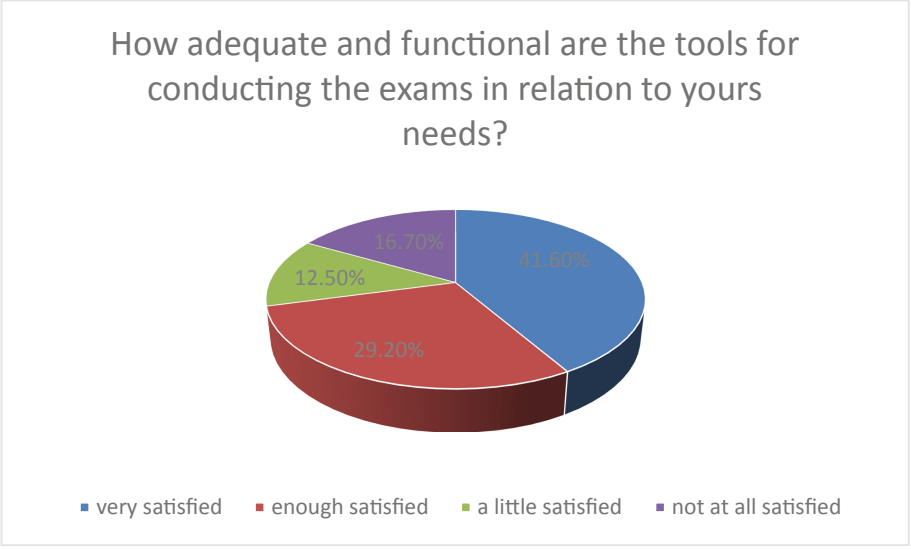

Fig. 9. Evaluation of the usability/availability of the tools for conducting the exams in relation to the needs of the students

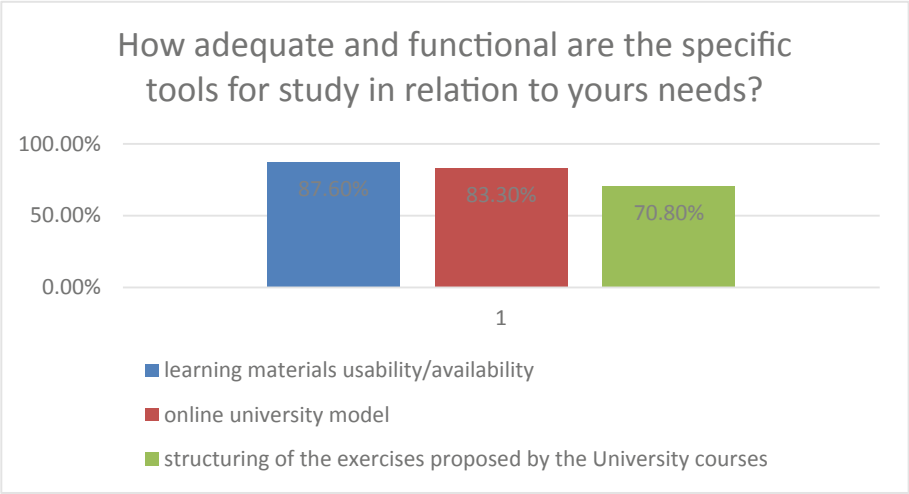

Fig. 10. Evaluation of the usability/availability of the tools for study in relation to the needs of the students

5 Final Remarks

To the best of our knowledge, this paper is the first to report descriptive data about the features of a VLE of an Italian online University, describing services and tools to support students with disabilities and with learning disability. As recently noted [1], many available Italian surveys have been carried out with the participation of students with disabilities only, excluding students with learning difficulties, and thus only offering the perspective of a specific academic part. Our descriptive information about the type of disability of students enrolled at e-Campus University differ from results of a recent national survey that involve 16 Italian universities [9]. The majority of this sample has a physical o motoric disability (58,47%) and only 1,64% has a learning disorder, whereas half of our sample has a learning disorder.

Differently from that, our preliminary data focus on student with learning disability as well. On the one hand, our data highlight the positivity of the services offered from our university; on the other hand, they provide useful suggestions on how such services could be improved. Unlike what was done in previous research [1], teachers were not involved in our survey. It will be interesting in the future to involve them so to better analyse and monitor all the services offered, as well as in training regarding disability as suggested by our students interviewed, and realized in other University [10]. Moreover, we will also investigate the non-academic aspects, such as concerns observed in relations to social inclusion in university life [11] and with peers support [12].

This report highlights possible enhancements to the eCampus VLE functionality to further improve inclusive support, which should not only take into account some "disabilities" (e.g. mobility impairments, sensory o hearing impairment), but all our population of students with special educational needs [13–15].

In a recent publication [16], the main research experiences were collected concerning the inclusion of students with disabilities in the university context, both nationally and internationally level. This volume shows the presence of great attention with regard to inclusiveness and accessibility in higher education, which includes the questioning of different actors. Compared to these, our contribution is an important first step towards monitoring and improving the services offered to students with special educational needs enrolled in an online university. For this reason, it will be important to continue studying in detail the various academic online contexts in Italy, in order to highlight the good practices and identify the barriers that are still hindering inclusion, thus fostering the dialogue between all parties involved at national level.

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