

## Digital skills of Valencian university students

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### **Abstract**

*With the outbreak of the COVID-19 pandemic, higher education changed overnight from face-to-face to e-learning. The tech shortcomings during the lock-down period were expected to affect students from the most disadvantaged students in a more negative way. The aim is to detect the strengths and weaknesses of Valencian university students in relation to the e-learning modality. A sample of 18,295 students from the five public Valencian universities, answered a four-sections online form: equipment, connection, experience and attitude. Results show that the Valencian university student community, in general, has sufficient equipment to follow e-learning, nonetheless 2% do not have any computer, not even in shared use. Three out of four have a broadband connection, but 0.7% of the participants cannot afford Internet access. 50% self-assess as a medium-low competence, two points in a five-level scale. Opinions reveal a strong preference for face-to-face teaching, although e-learning advantages are positively valued*

**Keywords:** Higher education; e-learning; digital skills.

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## **1. Introduction**

Lectures and Professors have always made use of any technology available to them to enhance learning, but the advent of the digital age has significantly boosted this process of technification. Since the end of the 20th century, when platforms for online teaching began to become popular, e-learning has not stopped growing. In 2019, the global e-learning market reached \$200 billion, and is estimated to grow by 8% per year until 2026 (Preeti & Saloni, 2020). However, growth estimates made before the COVID-19 era have been rendered obsolete, and surpassed by current market forecasts. The estimate made by Global Industry Analysts in the aftermath of the global pandemic is that the value of the e-learning industry will exceed US\$305.3 billion by 2025 (Wadhvani and Gankar, 2021).

With the outbreak of the COVID-19 pandemic, the situation practically changed overnight from face-to-face learning to e-learning. As a preventive measure, in March 2020 the academic authorities decided to suspend face-to-face teaching activities, leaving the universities to decide on the distance or blended learning systems that would allow them to continue teaching. Each university chose its own tools for teaching classes, enhancing its existing virtual campuses and, in many cases, opting for institutional videoconferencing platforms, such as *Microsoft Teams* or *Google Meet*.

The immediacy of the measure strained the universities' learning processes, making it difficult for students to adapt. University autonomy allowed schools and faculties to adopt various measures aimed at completing the academic year while maintaining the quality standards of education, and the Valencian higher education system demonstrated its resilience.

The tech shortcomings during the lock-down period affected students from the most disadvantaged families in a more negative way (Andrew et al., 2020; Hanushek y Woessmann, 2020). In order to guarantee equal opportunities and educational equity, the Valencian universities implemented mechanisms for inspection and attention to the most vulnerable population. One of the objectives was to identify this type of student body in order to provide them with support through the provision of equipment, connections and/or training.

## **2. Objectives**

The main objective of this study is to detect the strengths and weaknesses of Valencian university students, especially new entrants, in relation to the e-learning modality.

More specifically, the objectives of this study are as follows:

1. Determine the hardware and software equipment of the student body.

2. To know the type and speed of connection available to them.
3. To describe the experience and knowledge of online teaching tools.
4. To know the predisposition of the students towards e-learning.

### 3. Method

#### 3.1. Participants

The study population is made up of the undergraduate students of the five Valencian public universities enrolled in the 2020-2021 academic year. A total of 20,131 students participated in the study. The 1.82% (367 cases) decided to abandon before finishing the questionnaire. The sample filtering process included the identification of out-of-range responses, repeated cases and inconsistent responses, leaving the final number of valid cases at 18,295.

The final sample consisted of 11,907 women, representing 65.1% of the valid responses. The median age was 20 years, both for men and women. n

#### 3.2. Procedure

After obtaining authorisation from the UMH's project evaluation body (Ethic Committee code DPS.DLI.01.20 ), fieldwork started on September and lasted until October 2020. In order to encourage participation, the following communication strategies were implemented:

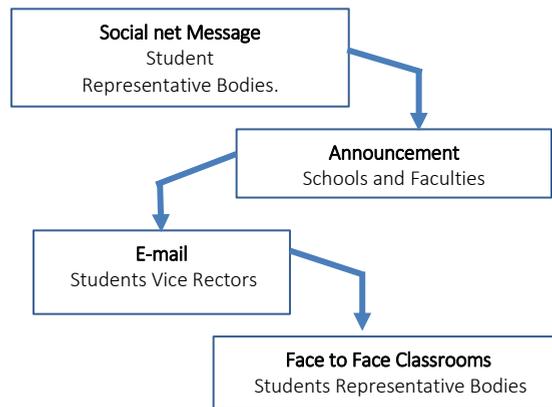


Figure 1. Communication strategies

#### 3.3. Measures

All data were obtained through a single online form: Questionnaire on Equipment and Use of Information Technologies by University Students compounded by 39 items organized in four sections: equipment, connection, experience and attitude, in addition to a section on sociodemographic and academic information. To build the questionnaire we applied a five-

stages methodology: I. Documentation, II. Item bank construction, III. Selection of items / Panel of experts IV. First version, and Piloting and V. Final Version

## **4. Results**

### ***4.1. Equipment***

The Valencian university student community, in general, has sufficient equipment to follow e-learning.

- 91.4% of the student body has a laptop for individual use. While 4.3% have a desktop computer as their only equipment.
- 4.3% reported having neither a desktop computer nor a laptop for personal use. This percentage is stable throughout the academic years. As an additional characteristic, six out of ten of these students live in the family home.
- It is estimated that approximately 2,000 Valencian university students (2%) do not have any computer, not even in shared use.

### ***4.2. Internet Connection***

In general terms, there are not excessive shortages in terms of the type of Internet connections by the student community.

- Three out of four students have access to broadband. Of those surveyed, 78.8% had fiber optics or ADSL. These results are consistent with those reflected by the Report on Digital Society (National Observatory of Telecommunications and the Information Society, 2019).
- 700 Valencian university students would not have any type of Internet access. 0.7% of the participants cannot afford Internet access. These results are in line with those presented in the report on the Survey on Equipment and Use of Information and Communication Technologies in Households (INE, 2019).
- Eight out of ten students have two or more gigabytes in their mobile data contract. Despite widespread access to mobile data, the availability of broadband means that the use of mobile data at home is low (28%).

### ***4.3 Experience***

Digital skills present marked differences mainly in terms of the gender and discipline of knowledge, above all.

- 18.6% of the student community considers that they have a high level of digital competence. The profile of a person with expert or advanced skills is a student in

the final years of a degree in Engineering and Architecture, preferably enrolled at the Universitat Politècnica de València.

- One out of two students rate their digital competence at user level, that in a five level scale corresponds to a medium-low competence.
- University education has a direct relationship with the level of digital skills. As one progresses through the academic year, the basic skills profile decreases, while the medium and high skills profiles increase.
- Men report higher digital competence than women (32.5% vs. 11.8%). It should be remembered that the measure does not reflect actual knowledge or competence, but rather their self-assessment, so it is worth asking whether women are more cautious in this regard.

#### **4.4 Attitudes toward e- learning**

Academic level is the main variable to classify the attitudes toward teaching in e-learning modality. First-grade students are significantly less motivated than advanced ones. In figure 2, blue color corresponds to high attitude towards using e-learning to teach, that increases as grades grow. In the higher grades, fourth grade and higher, women show a lower attitude.

Opinions reveal a strong preference for face-to-face teaching, although e-learning advantages are positively valued. This is probably due to the fact that face to face is perceived as major component of presential higher education courses.

- Students value positively the online evaluation. Overall satisfaction with the platforms, the lectures, the evaluation and the faculty is moderately positive, 3 points out of 5.
- The most highly valued advantages of e-learning are the opportunity to organize and save time, and the savings in transportation and accommodation.
- The main disadvantages of e-learning are: it makes it difficult to concentrate, negatively affects performance and sociability. Women and men rate it similarly.

## **5. Discussion**

The aim of this study was to analyze the strengths and weaknesses of Valencian university students, especially new entrants, in relation to the e-learning modality. For this purpose a sample of +18000 university students was surveyed on equipment, Internet connection, experience and attitudes toward e- learning.

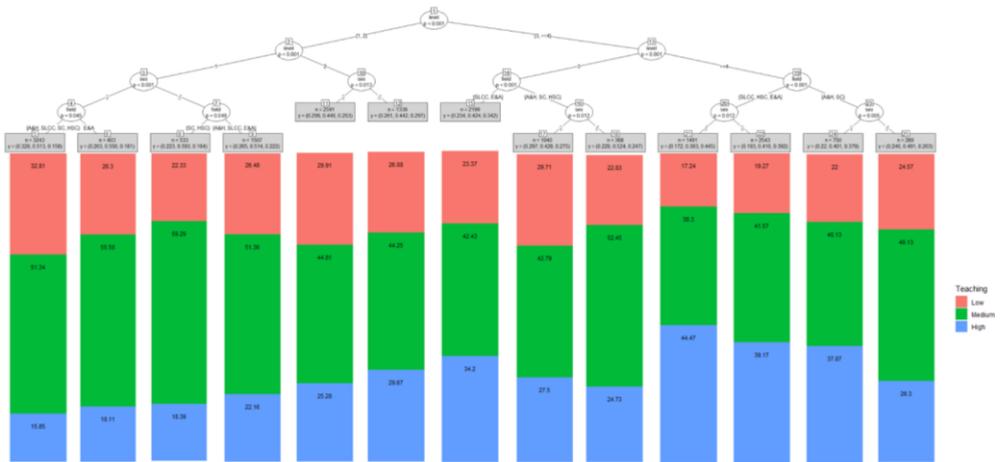


Figure 2. Attitudes toward teaching in e-learning modality.

The results show that practically all university students have sufficient equipment and connection to follow online teaching. It is noteworthy that 2% of the participants have no computer, not even in shared use and 0.7% cannot afford Internet access. What means a lower proportion than the general population. The Survey on Equipment and Use of Information and Communication Technologies in Households found that 3.2% of households do not have Internet connection (INE, 2021).

Regarding attitudes toward teaching in e-learning modality, there is a concern that e-learning difficults to concentrate, and negatively affects performance specially in first grade students. These findings are consistent with previous studies developed during the COVID-19 lockdown where first-year students were significantly less motivated during the learning process than older students (Stevanovic, Božic & Radovic, 2021).

The COVID-19 lockdown boosted the e-learning compulsory modality, and prevented from physical social interactions. This lack of face-to-face social activity could explain the difference in attitudes between lower and higher grades, assuming that first grades students are more interested in attending events such as meetings, classes, or even parties where they can meet their new classmates. This argument is in line with Giannoulas et al. (2021) that refers that e-learning prevents a satisfactory communication between students and students and teachers. However, the results are inconclusive, in that other studies show that there is a significant positive effect of COVID-19 lockdown on students' performance (Gonzalez et al, 2021).

E-learning offers an opportunity for individuals who find it difficult to take part in face-to-face education. Students appreciate the flexibility of e-learning to reconcile work, family and

education. It is the preferred option for older students many professionals who need the continuous training of postgraduate studies to update their knowledge in a constantly evolving market. E-learning has also provided an opportunity for those who live in remote areas and find it costly to attend face-to-face classes. In addition to the cost of tuition and materials, these students have to pay extra for travel, accommodation and living expenses.

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