

# Analysis: Digital Teaching/Learning

## Participating Organisations:

Complutense University of Madrid -SPAIN  
University of Thessaly -GREECE  
Eotvos Lorand Tudományegyetem University -HUNGARY  
Artemisszio Alapítvány -HUNGARY

## Leading Organisation:

Complutense University of Madrid -SPAIN

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## QUESTIONNAIRE “DIGITAL TEACHING/LEARNING”

### Objective

The COVID pandemic upset traditional academic life and turned makeshift online solutions a probable long-term feature of university, therefore, the general objective of this study was to know about the online teaching/learning experience for students and professors in universities that are part of the project ERASMUS + KA2 called *Stroll Walking the City*. Specific objectives are:

1. Describe the experience of online teaching/learning process during the pandemic.
2. Know about the tools most frequently used by students and teachers for online teaching/learning, and why.
3. Identify good practices in the use of tools for online teaching/learning.

### Method

This is a descriptive study based on surveys characterized by a systematic search of information, in which questions are asked to the subjects about the information you want to have, gathering them afterwards to obtain aggregated data during the evaluation. The survey tries to “get information in a systematic and orderly way, about the variables involved in an investigation [...] regarding a population or determined sample. This information refers to what people are, do, think, opine, feel, expect, wish for, want or hate, approve or disapprove, or the reasons behind their actions, opinions or attitudes” (Vallejos, 2011, p.127).

The *ad hoc* survey was designed by experts in the matter and consisted of 17 questions (4 closed and 13 open) about information related with general data, a first part linked with “What are your experiences with online teaching/learning?” and a second with “Teachers and students can choose from range of extraordinary digital tools, which ones do you like? Why do you like them?” (appendix 1).

It was written in English and made in Google Forms in order to be answered by students and teachers who attended universities of the *Stroll Walking the City* project in 2020-2021, during the pandemic. The final sample consisted in 115 subjects from those universities. The sampling was intentional, so each member of the project sent the link to their acquaintances. The estimated time to respond the survey was 15 minutes.

Analysis of the closed questions was made through quantitative analysis (descriptive statistics) with the help of Excel, and the open questions through qualitative analysis using the constant comparisons method proposed by Strauss and Corbin (2008) and the software Atlas.ti version 8. A total of 868 codes emerged during the qualitative analysis.

### Results

#### General data

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There was participation of 115 subjects in the study, 55 of which were students (47.83%) and 60 teachers (52.17%). They came from five universities, three of them in Spain, like the Complutense University of Madrid (33.91%), University Camilo José Cela (1.74%) and the University of Castilla-La Mancha (0.87%); the University Thessaly (55.65%) in Greece, and the Artemisszió Foundation (3.48%) and Eötvös Loránd University (4.35%) in Budapest. Therefore, 89.56% of the sample was concentrated in two universities: Complutense University of Madrid and University Thessaly.

Both students and professors in all the universities responded to the survey, except for in the University of Castilla-La Mancha and Artemisszió Foundation where only professors responded. The greatest difference between the percentage of students (60%) and professors (51.67%) was in University Thessaly (chart 1).

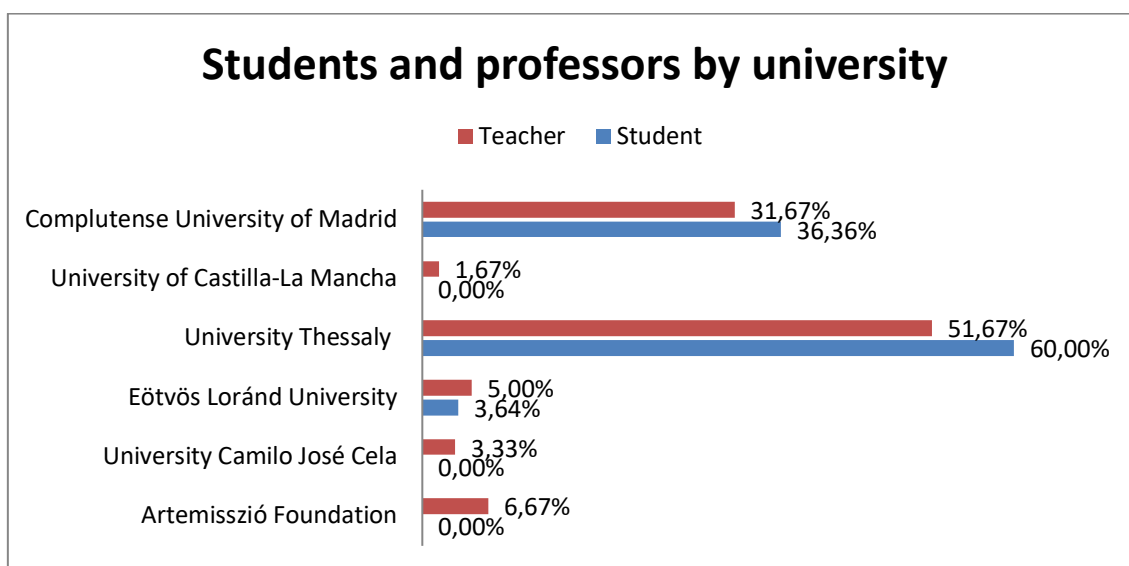


Chart 1. Percentage of students and professors by university

**First part. What are your experiences with online teaching/learning?**

**1.1 What has been your experience with online teaching/learning this past year?**

Regarding how online teaching/learning experience was in 2020-2021, 40% considers it was adequate and 43.47% rather positive or very positive. Only 16.52% considered it rather negative or very negative (chart 2).

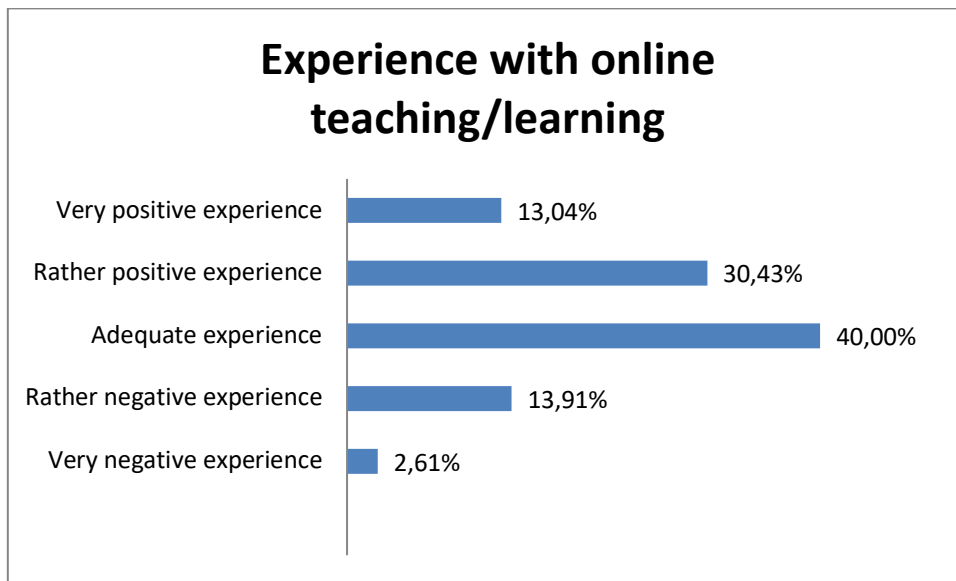


Chart 2. Evaluation of online teaching/learning experience

A more specific analysis indicates that the experience was less negative for university professors compared with students (42.11%), while for students it was very negative or rather negative with 57.89%. Similarly, 58.7% of the professors considered that the experience was adequate, but in students it decreases to 41.30%. Nevertheless, both professors and students value the experience in the same proportion as very positive or rather positive (50%) (chart 3).

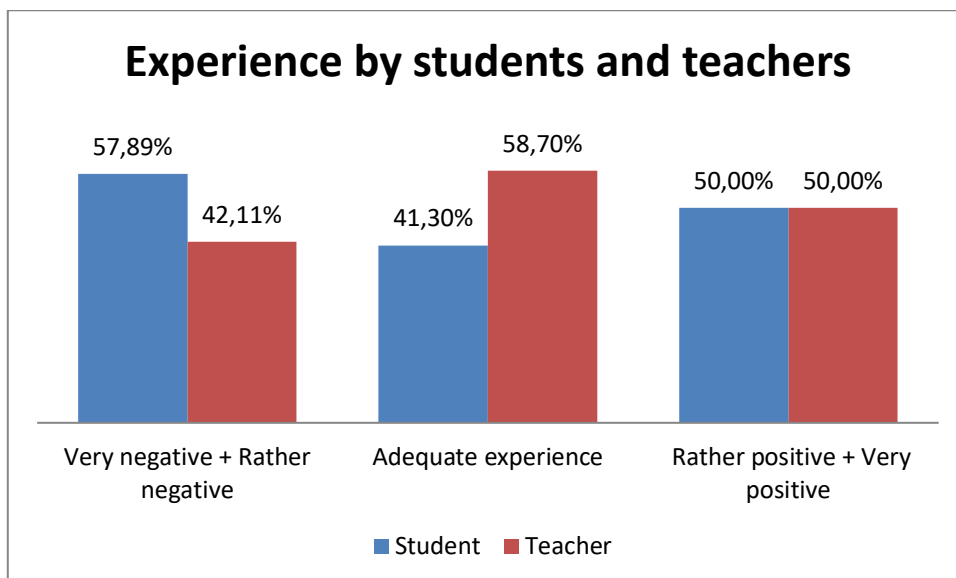


Chart 3. Evaluation of the experience according to students and teachers

In the same way, the evaluation that prevails in the Complutense University of Madrid, University Thessaly and in Eötvös Loránd University is “adequate experience” with 43.59%, 37.50% y 80%, respectively, and in Artemisszió Foundation (75%) and

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University Camilo José Cela (100%) a “rather positive experience”. Regarding the evaluation of the last two universities, this has to be cautiously interpreted due to the limited number of responses (chart 4).

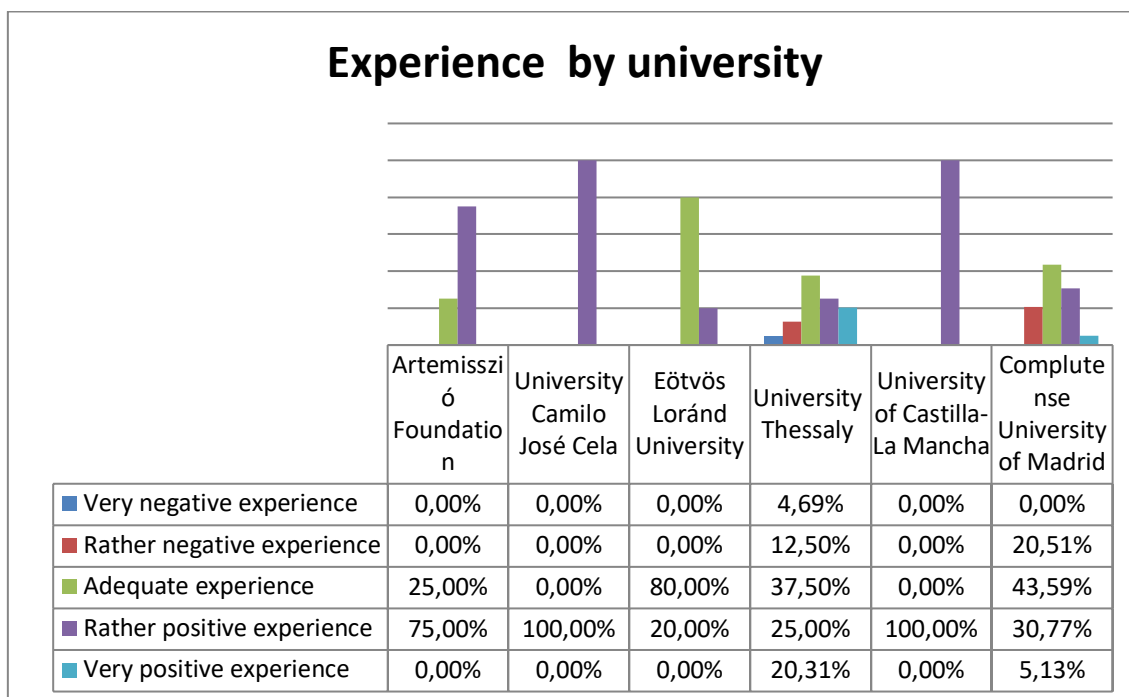


Chart 4. Evaluation of the experience by university

### 1.2 Could you please describe an interesting professional or learning experience as a teacher/student as regards this online process?

Among the experiences of the teaching/learning process that were interesting during the pandemic, learning of new digital platforms stands out along with training in online learning materials like integrate software (generic such as Collaborate, Google Meet, Zoom, Microsoft Teams; Google Drive) specific for teaching and learning mathematics such as GeoGebra or <https://www.mathlearningcenter.org/resources/apps> as well as integrate hardware (cameras, pen tablets), sharing screens and digital material.

“I have learnt how to use some tools”.

“The search for new methodologies to achieve active participation in clases”.

“Learning to integrate certain hardware (camaras, pen tablets) and software (generic such as Collaborate, Google Meet, Zoom, Microsoft Teams; Google Drive; and specific for teaching and learning mathematics such as GeoGebra or <https://www.mathlearningcenter.org/resources/apps>) in my teaching has certainly been the best outcome of this situation for me. I will keep using some of them when the situation finishes and we can come back to our “real” classrooms. I have also learned how future math teachers interact with digital mathematics manipulative resources”.

In the same way, some of the virtues pointed out were the easy connection from any place or from the comfort of home, and consequently less loss of time caused by

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travelling, as well as the possibility of including those who are not able to attend class in person due to different reasons. Professors had to come up with online teaching approaches vs the face-to-face approaches applied over all their teaching years, and for their part, students experimented increased fatigue, more distraction and disconnection as well as difficulty sustaining attention.

"I can learn from the comfort of my home".

"Regarding the Master's course, my experience of online tele-education has been positive because it allowed students from distant cities and regions to participate in the course".

"It is very challenging to keep the right timing-often times, I experienced, that I was ready with a task, and the facilitator gave an extra 15 minutes, because some participants were still engaged - from the perspective of group dynamics, working online is still difficult".

"Distraction: The drop outs are more frequent, especially when we talk about free, easy access trainings. Participants sign up, and in average half of them won't answer to any further e-mail, so "ghosting" is a definitely a factor. Also, as a learner during a very well-structured and interesting training, I found myself checking my e-mail, and social media account constantly during a session..it has been very difficult to keep the focus after a long working day in front of the computer. And it happened also with a small group size where I had to participate actively".

Despite the distance, there are those who considered that digital tools helped not to lose close contact between students-teachers and students-students, while for others it was one of the biggest challenges lived during the pandemic.

"Some students came closer to the teacher and become more friendly. I became the "teacher at home".

Both professors and students agreed that distance teaching/learning increases creativity and improves digital skills, class attendance, collaborative work, knowledge of ICT, involvement, readiness for work, group learning and, even for shy students, screens facilitated asking without shame. Similarly, it enhanced tutoring and continuous evaluation, although students complained about the number of presentations, which significantly increased.

"We could watch the lecture and do simultaneously the same thing that the professor advised us during this. Also, I could have recorded the lesson and delve into more infos when needed".

"When moving as teams of people during a lesson, in separate group chats and discussing with each other".

"There was no shame in asking questions"

"The importance of continuous assessment in order to be able to give proper marks".

The online approach requires more coordination with other colleagues and specialized training for professors, but the ease of connectivity allowed students and professors from different parts of the world to share a common international learning space. University

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professors noted that tools are a means for teaching and learning rather than an aim in itself.

“The opportunity to have different speakers from different city”.

“My usual way of teaching is structured on Learning Based on Projects, in which students actively participate in the development of learning tasks where the use of content of the subject is required in order to develop them. At the beginning of the confinement, as well as during the subsequent evolution of the course, and in the present one, I initiated a process of inquiry of digital resources in order to not have to change my learning method, turning tools into a real means for the learning process, rather than an aim in itself”.

### 1.3 What did you like most about online teaching/learning? What aspects of it did you like?

Students pointed out with special emphasis that distance-learning facilitates studies-work conciliation, they missed less classes, saved time because they did not have to travel to the university, made questions more freely being behind the screen, were able to listen to classes again when these were recorded, took an active role in their own learning, practised activities in their own computer, worked in small groups with different people, developed more comprehension than memory, were more participative, developed public speaking skills and, in general, improved their productivity level.

“Having online learning led me be worker and student at the same time”

“I liked that it gave more importance to thinking and creating rather than memorizing. As people could copy on the online exams, many teachers decided that the exams would not be so theoretical, but more practical. It has also allowed access to certain education to people who could not access to it before”.

Nevertheless, others considered that classes were less interesting, communication between professor-student and student-student was lost, people were more lazy and they could not always see their classmates faces. “To be able to multitask” was also part of what they liked.

“Honestly, I really miss in-person interactions. I guess online learning is convenient but. In a way it made me lazy however”

“The classes were less interesting but they were more used in terms of the syllabus and we could take more advantage of the hour and a half of class”.

Some professors - and also students - are in favour of a hybrid approach. Others, despite not being in favour of this model, accept that the lived experienced has broaden the repertoire of instructional strategies applied. Lessons had less noise and interruptions, the availability for the attention of students improved, exams were more practical than theoretical, and flexibility to give lectures and have meetings strengthened. They also agreed that the process of online teaching/learning requires more teacher planning.

“During the second semester of 2020 that I attended at the UCM, when we were able to go out and I felt emotionally better, I can say that for me it has been interesting that some seminars and conferences were virtual, because there is a better use of time. In this sense, I find blended education interesting”.

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"The flexibility a or location from I could give the lectures. I could also jump fast to a seminar etc.", "Has the flexibility for additional meetings", "Flexibility to do groups and jump from the general and small groups", "Flexibility with anachronistic online teaching".

"Easy contact with the students".

**1.4 Is there any aspect of this online teaching/learning that you didn't like? If YES, could you describe it?**

Besides the difficulties mentioned previously, some new aspects of online teaching/learning that were not considered positive were mentioned. Among them, the low socialization and participation on condition of anonymity behind the screens. Moreover, theoretical classes were more difficult to understand and follow, less interactive and even boring. A professor describes the process as "the dehumanization of learning", another states that "Many 'absent attendees' virtually linked on line", a third says that "Not known what (all) students do when I teach" and a fourth "The lack of immediacy with students", to which two students add "Didn't like the absence of natural presence" and "Feeling of being alone".

Some other aspects that were not of liking were related with the inability to develop discussions or debates, the limitation of observing student's reactions, the impossibility for deeply experimental labs, the need for real contact with materials (touch and feel) or to create routines and habits for online learning, a limited body language, technical problems with online exams, requests for class recording without a clear justification, and the excessive exposure time to screens.

"The "recorded class" replaced "power point". Students have requested recording of classes, even if they attend, which not necessarily guarantees better quality learning".

"Online teaching does not provide as many opportunities for interaction as "face-to-face" teaching, so teachers usually spend too much time explaining and lessons become too dense".

**1.5 Is there any aspect (method, strategy or good experience) that you would like to maintain in the future? If YES, could you please briefly describe this?**

However, there are learnings that were acquired during the pandemic and are wanted to maintain in tutoring: the use of cameras and pen tablets with projector; combined theater, big and small group discussions; online theoretical classes vs. practical face-to-face classes; communication through digital spaces; connect more than once a day; creation of a glossary of terms; project development; extra-activities with far people; imparting seminars, professional or colleagues meetings; invitation to teachers and follow courses in other cities. Some specific tools like Google Drive, Jamborards, JimBoard, Wikis, Genially and video platforms are added to this list.

"If they are theoretical classes they can be online, but if the classes are practical, attend classes like we did during the pandemic".

"We combined theater, big and small group discussions and it worked well. Sometimes we could discuss with students online even when offline teaching has started".



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“Yes: online extra-activities with far people and practice activities related to my teaching discipline based on online processes”

“I think that summarising many times what I have said helps students first to understand better but more importantly to fill any gaps during the lesson due to temporal bad internet connections or to some external noises or to any other reason that for a moment distracted their attention”.

“Involve students the decision process of the subject development”.

In the same way, distance learning could be maintained for postgraduate studies, or the blended learning model could be a new alternative to apply if the epidemiological situation gets worse or if a new pandemic emerges.

“YES. Exchange of information and material dynamically. Continue using digital teaching and communication tools complementarily to "live" teaching”.

“Distant teaching can be applied in unpredictable situations like heavy snow in Winter”.

**1.6 Did you have some good experience with a good learning outcome? If YES, could you describe it?**

Respondents highlight that, thanks to distance learning, the school year was not lost, besides that students were exposed to virtual records, exercises faster, extra lectures and demonstrations, use of map programs y gamification teaching techniques. Some other experiences associated with good learning outcome were the ability of self-regulation and autonomy, building of a safe space, the interest in studying COVID-19 effects in Greek economy, the creation of networks for future collaboration between students, and the promotion of multicultural learning. A student answered with humour: “I’m more nerd than before (if possible)”.

“Yes, the experience I describe above: Colombian people learnt quite a lot about Spanish landscapes and global environmental education thanks this online teaching activity, as well as my Spanish students leant about Colombian landscapes, which they didn't known before”.

“Students' interest in the effects of covid-19 on the Greek economy”.

“More students participated in the above-mentioned gamification teaching technique”

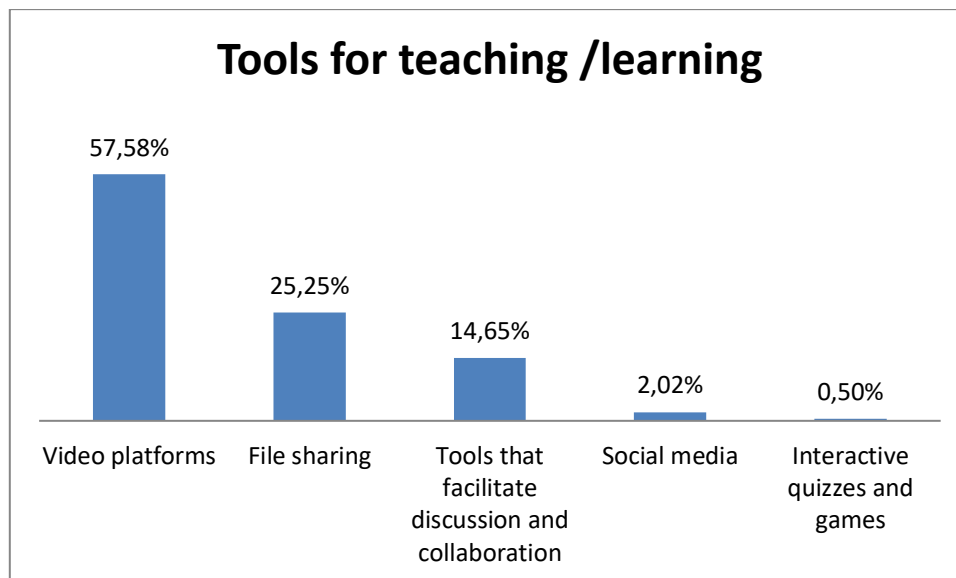
“As a trainer, I am satisfied with our workshops, as a teacher it is much harder to assess what my students have learned (no immediate feedback)”.

**Second part. Teachers and students can choose from range of extraordinary digital tools, which ones do you like? Why do you like them?****2.1 Among all these tools available for teaching/learning online, which ones do you use for teaching/learning? (You can chose several options)**

Regarding the available online teaching/learning tools, some video platforms like Zoom, Jitsi, Meet, Skype, Teams, Webex ...were the most commonly used with 57.58%, followed by file sharing (25.25%) and other tools that facilitate discussion and

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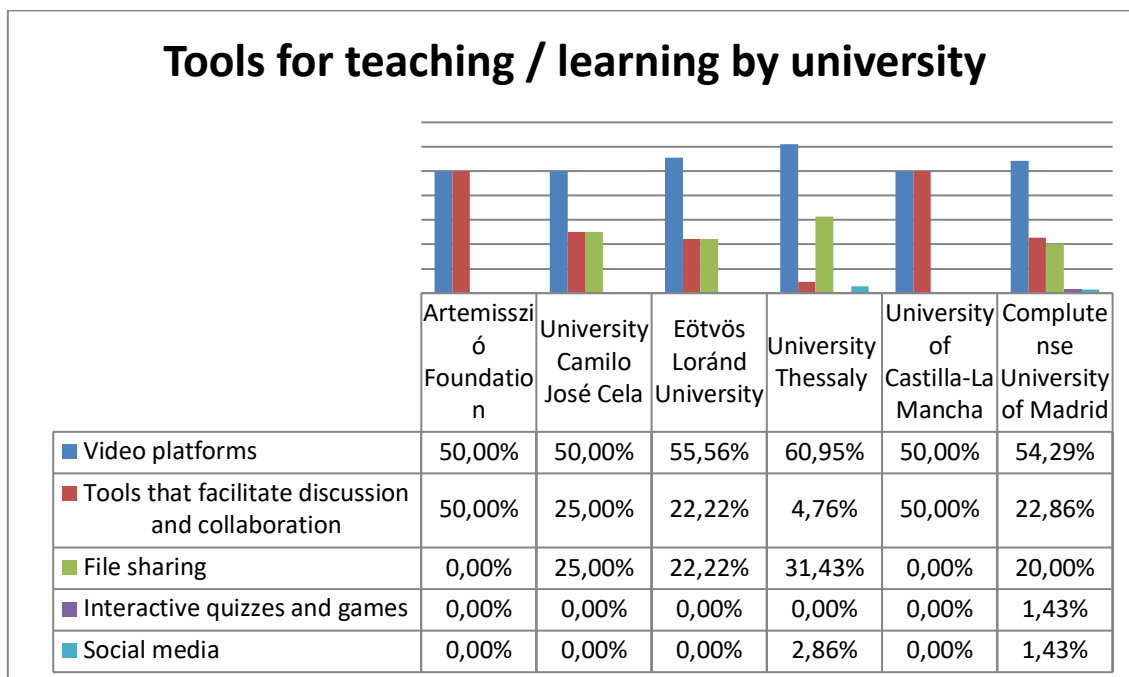
collaboration (14.65%). The least used tools were social media (2.02%) and interactive quizzes and games (0.50%) (chart 5).



Leyenda: Video platforms (Zoom, Jitsi, Meet, Skype, Teams, Webex ...), File sharing (Drive, Dropbox, ...), Tools that facilitate discussion and collaboration (Mentimeter, padlets, muraly, glogster, ...), File sharing (Drive, Dropbox, ...), Interactive quizzes and games (Kahoot, Baamboozle, Quizizz, ...), Social media (Instagram, Facebook, Twitter, ...).

**Chart 5. Tools for online teaching/learning**

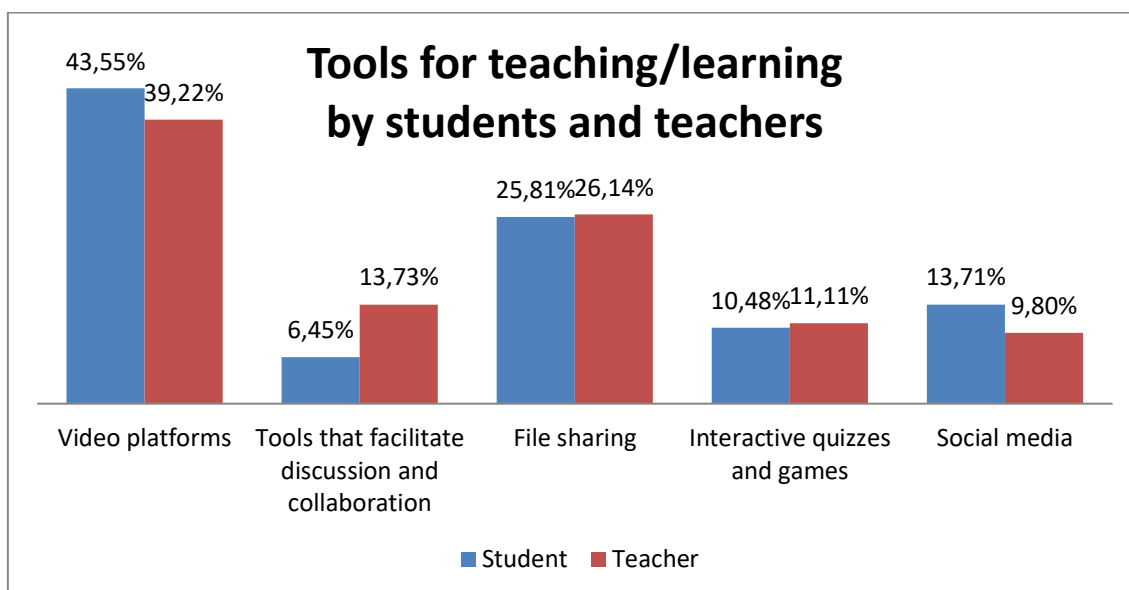
When analysing online teaching/learning tools by university, we can see that video platforms and tools that facilitate discussion and collaboration were used in all the universities, while file sharing was only used in University Camilo José Cela, University Thessaly and Complutense University of Madrid. Social media in the University Thessaly and Complutense University of Madrid, and interactive quizzes and games only in the Complutense University of Madrid (chart 6).

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Legenda: Video platforms (Zoom, Jitsi, Meet, Skype, Teams, Webex ...), File sharing (Drive, Dropbox, ...), Tools that facilitate discussion and collaboration (Mentimeter, padlets, muraly, glogster, ...), File sharing (Drive, Dropbox, ...), Interactive quizzes and games (Kahoot, Baamboozle, Quizizz, ...), Social media (Instagram, Facebook, Twitter, ...).

Chart 6. Tools for teaching/learning by university

Likewise, chart 7 shows that file sharing and interactive quizzes and games were used in similar proportions by students and professors, while students used more video platforms (43.55%) and social media (13.71%), while professors used tools that facilitated discussion and collaboration more frequently (13.73%) (chart 7).



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Leyenda: Video platforms (Zoom, Jitsi, Meet, Skype, Teams, Webex ...), File sharing (Drive, Dropbox, ...), Tools that facilitate discussion and collaboration (Mentimeter, padlets, muraly, glogster, ...), File sharing (Drive, Dropbox, ...), Interactive quizzes and games (Kahoot, Baamboozle, Quizizz, ...), Social media (Instagram, Facebook, Twitter, ...).

## Chart 7. Tools for teaching/learning by students and teachers

**2.2 If you use other ones, please list them here.**

Some tools were added to this list, being virtual campus the most commonly used with 33.33%:

- |                                 |  |
|---------------------------------|--|
| 1. Adobe                        | 12. Jamboard                                 |
| 2. Canvas                       | 13. Metafox                                  |
| 3. Discord                      | 14. Miro                                     |
| 4. Games_SDGs /UN official site | 15. Online GIS                               |
| 5. Gather                       | 16. Pollev.com                               |
| 6. Genially                     | 17. Prezi                                    |
| 7. GeoGebra                     | 18. Pullrverywhere                           |
| 8. Google classroom             | 19. Resources teach and learn<br>mathematics |
| 9. Google forms                 | 20. Scrubble                                 |
| 10. Google maps                 | 21. Team viewer                              |
| 11. Google Scholar              |  |

**3.1 Which one of these tools would you recommend? (Recommendation 1)**

Students and professors were asked about which tools they would recommend, why and what interesting features they consider it has. Video platforms prevail as the first recommendation (59.52%), followed not so close by social media (16.16%), and with an even greater distance is file sharing (5.55%), virtual campus (4.76%) and interactive quizzes and games (3.96%). Other tools were added, different from the ones already mentioned in chart 5, all of them with 0.79%: Adobe, digital pen, Discord, Genially, Jamboard, Miro, Online GIS and VoiceThread.

**3.2 Why do you like it? (Recommendation 1)**

That said, when asked why they chose these tools and not others, responses give account of pedagogical but also technological aspects:

- Collaborate. Designed for teaching, communication, includes microphone and camera, easy to handle, easy to use, for all ages.
- Discord. Many capabilities.
- Drive. Easily accessed and very functional, intuitive, popularized, sharing files and documents.
- Dropbox. Easily accessed, very functional.
- Games. Enhances motivation and commitment, being alert.
- Genially. Ilimit creative possibilities.
- Google. Teamwork
- Instagram. Engaged, take foto and speak with friends.
- JamBoard. Share knowledge.
- Jitsi. Free and easy to use.

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- Kahoot. Dinamic activities online at home, meet without moving, share materials, record it.
- Maps Google. Keep track of the places and create together.
- Meet. Proper functioning, gives no problems, connect at same time, interchange information, easy to use, connection with many people, duration of the session, free of charge, integrated with Google, it is in the Gmail package, intuitive, popularized, small group work.
- Mentimeter. Easy to use, elaboration of quizzes, promotes participation of shy students.
- Online GIS. Learning mapping geographical processes.
- Padlet. Dinamic activities online at home; share photos, ideas and materials; easy to use; several users at the same time.
- Power point. Unlimited creative possibilities.
- Quizzes. Enhances motivation and commitment, being alert.
- Skype. Easy to use, multiple people in real time.
- Teams. Good functioning; easy to use and access; friendly; develops different skills; access to a variety and quantity of de tools; integrated tools; tools that can be used in parallel; stable and solid; strong program; attend by a large number of participants; forward files; complementing teaching task; improves collaboration, communication and commitment; meet without moving; share materials and works; record it; nice flow; no interruptions; simulation classroom; study meeting; manipulate documents; various options; located in the virtual campus; offered by the university.
- Video platform. Interactive, meet people, see and hear the other person, easy to use, to express oneself in a natural way, meet synchronously, includes sound and image, presentation speed and share, good functioning.
- Virtual campus. Intuitive and popularized; transfer documents; not pretend to substitute proper in-class; face-to-face lectures, seminars and tutorials.
- VoiceThread. To keep one thread on a topic.
- Webex. Goos functioning.
- Zoom. Connect at same time, interchange information, easy to use, multiple people in real time, does not require to download and app, meet without moving, share materials, record it, nice flow, reliable platform, friendly, set of tools, to accomplish other applications, small group, shared screen and workplace.

### 3.3 What interesting features does it have? (Recommendation 1)

A more specific analysis synthesizes the most interesting aspects of the tools mentioned before, and some new ones:

- Adobe. Intuitive.
- Collaborate. Ability to communicate with others easily; includes chat, camera, video y board; screen presentations; recordings of sessions; students can hands up in order; file handling.
- Discord. Compared with teams or zoom, it allows to create mini-groups.
- Games. Dynamic, attractive, favours active role.
- Genially. Create and elaborated instagram post.
- Google. Cooperative working.

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- Instagram. Share teaching content.
- Jamboard. Increases participation, easy to use.
- Jitsi. Easy to use
- Kahoot. Create avatars, fun, white board for painting, multiple choice, descriptive imagines, group work, healthy competition, very useful in the future for professional development.
- Meet. Camera; screen presentations; recordings of sessions; share same time; keep eye contact; share windows, files and screen; synchronizing google calendar; create or receive any link to use it; functional; accessible; free of charge; no need to download anything else or learn a new tool.
- Mentimeter. Analyse information in few seconds, interactive participatory presentations.
- Online GIS. Location, Georeference, mapping.
- Padlet. Multiple choice, descriptive imagines, group work, healthy competition.
- Quizzes. Dynamic, attractive, active role.
- Skype. Video call, chat, send pictures, links and documents.
- Social media. Easy to use, familiar, simplicity.
- Team viewer. More interactivity.
- Team. Attendance control; private chat organising group chats; chat with everyone and with the own team; raise a hand for questions; includes camera and microphone; connect same time without delay; create avatars; fun; white board for painting; easy to use; connectivity; display and upload documents; group meetings; one to one calls; nice interface and tools; presentation access; communicate exchanging text messages; file cloud; real time visual data; reliability; list of participants; visual communication between participants; interactivity; share screen registered persons, meetings, calendar, files and video calls; small group; tools of engagement; various options and tools that can be used in parallel.
- Video platform. Ability to assess attendance, face-to-face conversations, small group, share documents, easy to use, familiar, flexibility, high degree of functionality, meet with student, rapidity, split group, simplicity.
- Virtual campus. Transfer documents; not pretend to substitute proper in-class; face-to-face lectures, seminars and tutorials.
- Webex. Includes camera y microphone, share screen.
- Zoom. Different icons to give reactions; hands up function; chat; connect same time without delay; create avatars; fun; white board for painting; effective communication; filters; common drawing possibility; friendly; small group; shared screen and workplace; video call; send pictures, links and documents.

**4.1 Would you recommend other tool? Which one? (Recommendation 2)**

When comparing the second recommendation with the first one, video platforms (28.8%), social media (17.3%), file sharing (17.3%) and interactive quizzes and games (9.62%) not only reappear but they also have the same order of preference. Some new ones like

Chat, Google Forms, Messenger, Tik Tok, Translate it and You Tube are added, although the virtual campus reappears but with a smaller percentage (1.92%).

#### 4.2 Why do you like it? (Recommendation 2)

The reasons why they have chosen those tools were:

- Chat. Shy students that do not want to talk directly.
- Drive. File sharing, construct a group project, access documents from any device and share them, people working same time, save all your papers to not lose it if you computer doesn't work, simultaneous interaction, small group.
- Dropbox. File sharing, easy to use.
- Instagram. Construct a group project.
- Facebook. To take photos, speak with friends.
- File sharing. Share documents, feedback, team work.
- Genially. Ludic, interactive way.
- Glogster. Collaborate and improve ICT skills.
- Google Drive. Many people can work on the same thing at the same time, changes real time, working together online.
- Google forms. Easy to use.
- Instagram. Short videos that draw better attention.
- Jamboard. How students write, compare responses, encourages collaboration over competition, friendly.
- Kahoot. Fun way to compete and test your knowledge, gamification, increases motivation, interactive, fun teaching session.
- Meet. See a lot of people during the meeting, warm the human interaction.
- Mentimeter. Creating word clouds is very visual tool; to take information from students about one lesson or topic; opened questions; share interest, feelings...easy to use; messenger already.
- Miro. Design thinking.
- Padlet. Student engagement, quick and easy way.
- Quizzes. Makes it fun, very motivating.
- Skype. Easy installation required.
- Social media. Easy to use, used people all over the world.
- Teams. Easy for beginner.
- Translate it. Translate text into different languages.
- Youtube. Sharing art projects widely and freely.
- Zoom. Free communication, to see a lot of people, share documents.

#### 4.3 What interesting features does it have? (Recommendation 2)

And they are interesting for distance education because:

- Chat. Anyone can use it and comment.
- Discord. It is simple in use.
- Drive. Download different formats; edit the same file in the same time; enrich learning; collaborative; favours academic writing; used for documents,

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- presentations and sheets; chat; a place for comments; control who has access to it; you can see previous versions.
- Dropbox. Easily access and sharing.
  - Facebook. Learning for interesting things.
  - File sharing. Keep sure documents, share same documents at the same time.
  - Genially. Attractive and easy to use.
  - Glogster. Dynamic, promotes creativity and communicative skills (summarising, writing...).
  - Google form. Easy to use.
  - Instagram. Enrich learning, music, funny videos, interesting tips.
  - Jamboard. Different groups can work, add picture and presentation everyone can check, write, use stickers, insert picture, comments on each other's work, peer cooperation, tasks allocation.
  - Kahoot. Fun for students, easy to use, multiple games modes, create quiz, communication, cooperation, creativity, trivial game in which everyone can play through their phone.
  - Mentimeter. Creativity.
  - Messenger. Easy Access, video call, voice chat, don't have to download other app.
  - Paddle. To upload videos and photos, add comments.
  - Quizzes. Accessibility, many tools to achieve integrity.
  - Skype. Video call, participation.
  - Social media. Facility of access.
  - Teams. It is like others but with the blessing of Microsoft, share content, effective chat, attendance forms.
  - Tik tok. Music, funny videos, interesting tips.
  - Translate it. Translate text different languages.
  - Youtube. Upload videos.
  - Zoom. Free, good quality, schedule meetings.

## 5. Other suggestions and comments

Lastly, students as well as professors acknowledge that the pandemic has developed resilience, adaptation and flexibility, tracing a personal, academic and professional learning in their lives. They would also like to appeal to resist against the disappearance of universities as the civil society's democratizing space "Resist the withering away of Universities, a mainstay of Civil Society". Likewise, they want to go back, as soon as possible, to in-person classes.

COVID has been a personal and academic challenge, in words of a student "It was an experience", with positive results in psycho-social well-being, but also negative ones. Technological tools have to be at the service of the teaching/learning process, but never replace it "Online teaching very good complement but not an alternative" y "Online teaching not substitute face-to-face teaching". Teachers demand more support from institutions for the procurement of programs for online teaching, and for an updated and permanent educational technology training.

## Referencias





IO1 Preliminary Research: **Analysis (Digital teaching/learning)**

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