# COMPENDIUM OF GOOD PRACTICES EU PARTNERS

**Project: Modernisation of Higher Education in Central Asia through New Technologies (HiEdTec)**

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**Modernisation of Higher Education in Central Asia through New Technologies (HiEdTec)**

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## List of Abbreviations

| | | |
|---|---|---|
| HiEdTec | – | *Modernisation of Higher Education in Central Asia through New Technologies* |
| HE | – | *Higher Education* |
| LMS | – | *Learning Management System* |
| LLL | – | *Lifelong learning* |
| VLE | – | *Virtual learning environment* |
| MOOC | – | *Massive Open Online Course* |
| OER | – | *Open education resource* |
| UR | – | *University of Ruse Angel Kanchev* |
| ATU | – | *Almaty Technological University* |
| InEU | – | *Innovative University of Eurasia* |
| AIU | – | *Ala-Too International University* |
| IKSU | – | *Issyk Kul State University named after K.Tynystanov* |
| KSTU | – | *Kyrgyz State Technical University named after I. Razzakov* |
| KhoSU | – | *Khorog State University named after M.Nazarshoev* |
| TTU | – | *Tajik technical University named after academician M.Osimi* |
| TUT | – | *Technological University of Tajikistan* |
| IUHD | – | *International University for the Humanities and Development* |

| | | |
|---|---|---|
| TITU | – | *Oguz Han Engineering and Technology University of Turkmenistan* |
| SEIT | – | *State Power Engineering Institute of Turkmenistan* |
| AndMI | – | *Andijan Machine-Building Institute* |
| TSUE | – | *Tashkent State University of Economics* |
| TUIT | – | *Tashkent University of Information Technologies named after Muhammad al-Khwarizmi* |
| UPV | – | *Università degli Studi di Pavia* |
| UL | – | *University of Luxembourg* |
| UC | – | *University of Coimbra* |
| MES | – | *Ministry of Education and Science of the Republic of Kazakhstan* |
| MES | – | *Ministry of Education and Science of the Kyrgyz Republic* |
| MES | – | *Ministry of Education and Science of the Republic of Tajikistan* |
| MET | – | *Ministry of Education of Turkmenistan* |
| MHSSE | – | *Ministry of Higher and Secondary specialized education of the Republic of Uzbekistan* |

## EXECUTIVE SUMMARY

**TO CREATE COMPENDIUM OF GOOD PRACTICES WE ARE TAKING IN ACCOUNT PUBLISHED STUDY ON INNOVATION IN HIGHER EDUCATION PUBLISHED BY EUROPEAN UNION. THE FINAL REPORT OF THIS STUDY PUBLISHED SEVEN CASE STUDIES AND TAKING IN ACCOUNT RESULTS OF QUESTIONNAIRE.**

The first chapter described the results of mentioned Study. Content of second chapter is based on results of questionnaire produce in Task 1.1. Third chapter is comparisons of findings in chapter one and two plus outputs from project consortium meeting in Ruse.

This document presents results of the questionnaire data analyse and summary in the form of a report. This draft report outlines the current knowledge and expertise of the EU partners in the integration of digital technologies and resources in HE.

A draft of the report on the implementation of innovative educational technologies and didactic models in the EU partner countries is produced by University of Luxembourg and improved by other EU partners. Based on the feedback gathered University of Luxembourg revised the report and produce the final version. The report will be uploaded in an open format on the project's web page.

**The main objectives of deliverable:**

- Design a draft template for the collection of effective and evidence based good practices examples of the implementation of innovative educational technologies and didactic models in the teaching and learning at university level in the EU consortium institutions.
- Summarise the collected good practice examples.

## 1 INTRODUCTION

The purpose of questionnaire was to gather feedback on the knowledge and experience of EU partner country Universities and their teaching staff on the implementation of innovative educational technologies and didactic models in the process of teaching and learning in higher education. It will provide information about the current state of affairs of teaching methods and technologies in Europe which will be used to guide the involved Asian countries to better and more modernized teaching methods.

## 2 PROJECT OVERVIEW

***The main aim*** of the project is to adapt the education system in the PCs to the digital generation through introduction and effective use of ICT-based Innovative Educational Technologies and Didactic Models (IET&DMs) in the teaching process.
This aim corresponds to the strategic priorities for development of education in each of the Partner Countries (PCs), i.e. supporting the use of digital technologies and online delivery to improve pedagogies and assessment methods.
The project will help turn the partner higher educational institutions (HEIs) into innovative universities and will improve the quality of the trained specialists who are necessary to perform the Digital Transformation of Industries (Industry 4.0).

***The consortium*** comprises of 24 full partners – HEIs from 4 EU countries and 5 partner countries.
The consortium includes two types of higher education institutions (HEIs): European HEIs with solid experience in the innovative educational technologies and HEIs from Central Asia which want to introduce these technologies and open pedagogies in the field of higher education in order to improve and extend the supply of high quality learning opportunities tailored to the needs of digital learners. The consortium also includes all PC Ministries of Education which will contribute to the dissemination, extension of impact and sustainability of project results in each partner country.

The EU partners are well-known European universities with rich experience in innovative educational technologies (IETs). In addition, a part of them have established contacts and cooperation with some of the partners from the PCs and are therefore familiar with the higher education system, the facilities available and the main challenges which HEIs in the partner countries face. This provisional knowledge of some of the EU partners of the partner countries and the universities in them is an essential prerequisite for establishing successful collaboration from the project start.

## 3 IMPLEMENTATION OF INNOVATIVE EDUCATIONAL TECHNOLOGIES

This work implements analytical framework developed by Study on Innovation in Higher Education [1]. The study proposed adopting concept of innovation systems and adapting it to HE. The analytical construct of ´higher education innovation system' has thus been developed as a sub-set of an innovation system, concentrated particularly in higher education institutions which are in close connection with other institutional spheres, such as industry, government and non-government agencies, and the society at large. A higher education innovation system can be seen as a set of functions, components and relationships, which allow us to disaggregate the various levels of interactions among the elements of the system and analyse the unfolding of innovation in higher education, as summarised below.

| Higher education innovation system | | |
|---|---|---|
| **Functions** | **Components** | **Relationships** |
| • Education<br>• Research<br>• Engagement ('third mission') | • Direct and indirect actors<br>• Institutional and individual actors | • Collaboration/conflict moderation<br>• Substitution<br>• Networking |

*Table 1: Higher education innovation system*

The Study on Innovation in Higher Education outcomes came from seven case studies and questionnaire.

| Case study | Theme |
|---|---|
| Innovative approaches to teaching and learning at the Olin College of Engineering (US) | The changing landscape of teaching and learning in higher education |
| Macro-level blended learning at the Bavaria Virtual University (Germany) | |
| US- originated MOOCs (Coursera, Udacity, NovoEd) | |
| EU-originated MOOCs (multi- and single- institution platform providers) | |
| The development of Learning Analytics at Purdue University (US), University of Derby (UK), and University of Amsterdam (the Netherlands) | Technology and the student performance in higher education |
| The eAdvisor at Arizona State University (US) | |
| The internationalisation strategy of the University of Nottingham (UK) and the establishment of campuses in Asia | Globalisation and multicampus universities |

*Table 1: Higher education innovation system*

The main findings:

1. Pressures from globalization,
2. Changing supply of and demand for HE,
3. Changes in HE funding.

Three dynamics appear according the study to be most significant within an innovative higher education system:

- As innovation diffuses within the higher education system and touches every element of a higher education institution, the innovation process needs to be better managed. While management methodologies are taught in many universities, university managers are not trained for this, and in most cases, they are promoted academics;

- There is a reciprocal nature of change within an innovative higher education system: the system elements (components, relationships and functions) have an impact on the success of the innovation, while the success of the innovation induces further changes in the system elements. A spiral of change is thus created within the higher education system to make it more responsive to environmental changes;
- The change induced in a higher education innovation system by the innovative practices examined in the study is not of a radical nature, but is rather slow and incremental. Many innovation practices do not radically modify the traditional Higher education institutions' functions; rather, they provide new ways of doing traditional things that that respond more efficiently to changing requirements in higher education.

For purpose of our work are important findings of mentioned study:

**Policy recommendations related to the changing landscape of teaching and learning in higher education**

Higher education institutions should consider the need to:

- Nurture an institutional culture to innovation that enhances creativity, creates awareness of the benefits resulting from the implementation of the innovation, stimulates openness to innovation and minimises resistance to change
- Consider incentives and rewards for members of staff (including but not limited to academics) who engage in innovative practices
- Engage faculty members in exploiting the potential of new learning technologies· Consider the use of cross-institutional collaboration to improve student choice and quality (and possibly cut costs)
- Put in place adequate measures for skills development of teaching staff and also for greater collaboration in performing their teaching duties
- Review existing organisational boundaries and linkages

Policy-makers should consider the need to:

- Establish a clear regulatory framework that addresses blockages that some developments in online learning are faced with today, including: inappropriate quality assurance mechanisms, the lack of credit recognition processes and intellectual property right regulations.

**Policy recommendations related to technology and student performance in higher education:**

Higher education institutions should consider the need to:

- Identify the (diverse) needs and circumstances of the learners;

- Ensure learner access to relevant technologies and possession of necessary skills to gain maximum benefits from them;
- Recognise that the successful introduction of learning analytics will be dependent not only on the choice of technology but on making the institutional changes necessary so that teachers, IT staff and administrators work effectively together to support students.
- Provide appropriate processes, tools and support activities so that Faculty are able to fully utilise the rich data generated through analytics to enable them to respond to individual student needs and to further develop their teaching.
- Clarify the roles of the different actors (within and beyond the institution) involved in meeting these needs;
- Ensure a collective understanding of the different roles/responsibilities and the relationships between them
- Ensure clear lines of management responsibility and information requirements to assess performance
- Build supportive relationships and trust between the relevant actors (students, academic staff, support staff, IT staff, managers and, where applicable, employers)

Policy-makers should consider the need to:

- Clarify the funding implications, intended outcomes and timescales for the innovation
- Collect and analyse feedback information (from learners, institutions, employers etc) on performance and impact, and inform all relevant actors
- Identify any unintended consequences of the innovation (e.g. for other functions, for widening participation or labour market linkages)

**Policy recommendations related to globalisation and internationalisation strategies**

Higher education institutions should consider the need to:

- Balance commercial, educational and reputational considerations in formulating overall international strategy
- Address a range of interconnected factors such as student mobility (inward and outward), student placements, qualification recognition, funding implications, curriculum and pedagogic implications, and labour market linkages
- Consider the needs of different actors including home and international students, academic and support staff, quality assurance agencies, employers and sponsoring bodies

- Engage 'home' staff and to build relationships between staff located at the different campuses
- Establish how much to 'export' from the home institution and how much to build to reflect local contextual factors at different campuses
- Establish how much to 'import' from the international activities to reshape the home institution
- Satisfy different national regulatory and quality assurance regimes

**Policy-makers should consider the need to:**

- Provide support for inward and outward mobility of students

# 4 HiEdTec Questionnaire Results

## *4.1 General Information*

The purpose of this questionnaire is to gather feedback on the status quo in terms of the level of implementation of digital technologies and the level of competences of academic staff in the use of ICT tools in higher education of Asian partner country Universities and their teaching staff.
It will provide information about the current state of affairs of teaching and technologies in our partner countries in Central Asia which will be used to give "Recommendations for Adapting the Central Asian HE System to the Needs of the Digital Learners".

We received originally 6 answers to our questionnaire from all the 4 European partner Universities that are partners in the HiEdTec project. After second round of questionnaire in 2020 we received 149 responses.

First round of questionnaire get 11 out of the 16 people who filled in the questionnaire filled in the answer in which country they work, so 5 answers are uncertain. Most answers seem to come from Portugal (5), while 2 come from Bulgaria and from Luxembourg as well as 2 from Italy.

Second round of questionnaire 133 out of the 149 people who filled in the questionnaire filled in the answer in which country they work, so 16 answers are uncertain.

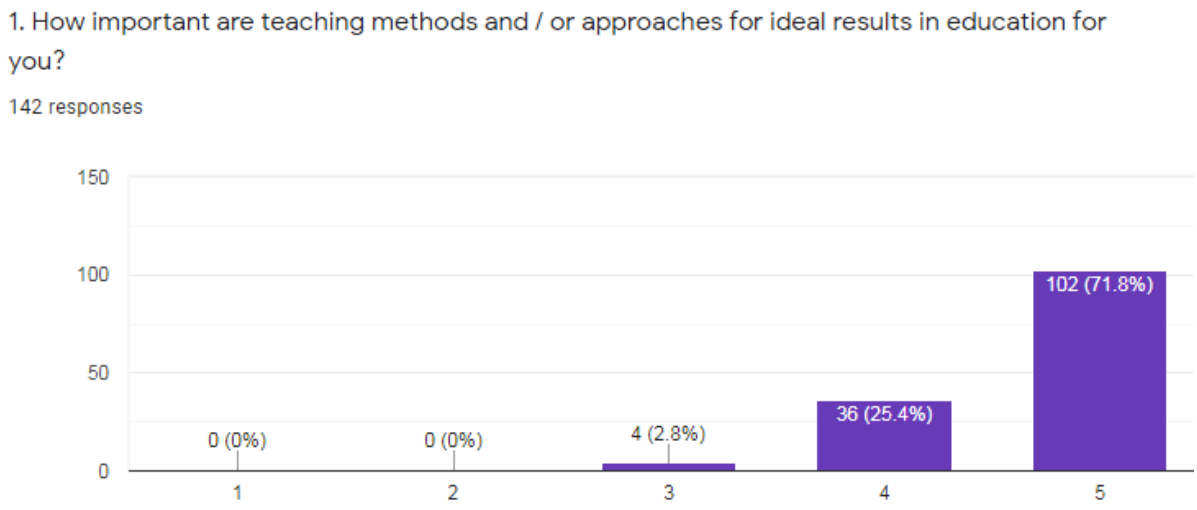
In previous questionnaire we only received 13 responses out of 16 to the question which position the questioned person holds at the University in his/her country.

The teaching staff varies from Professors (9) over Postdocs (1), PhD students (1), other lecturers (1) , Technical support (1) as well as 1 Unit Coordinator / Project Manager.
Also 1 Investigator (Pedagogical staff) and 1 Research Scientist gave their answers.

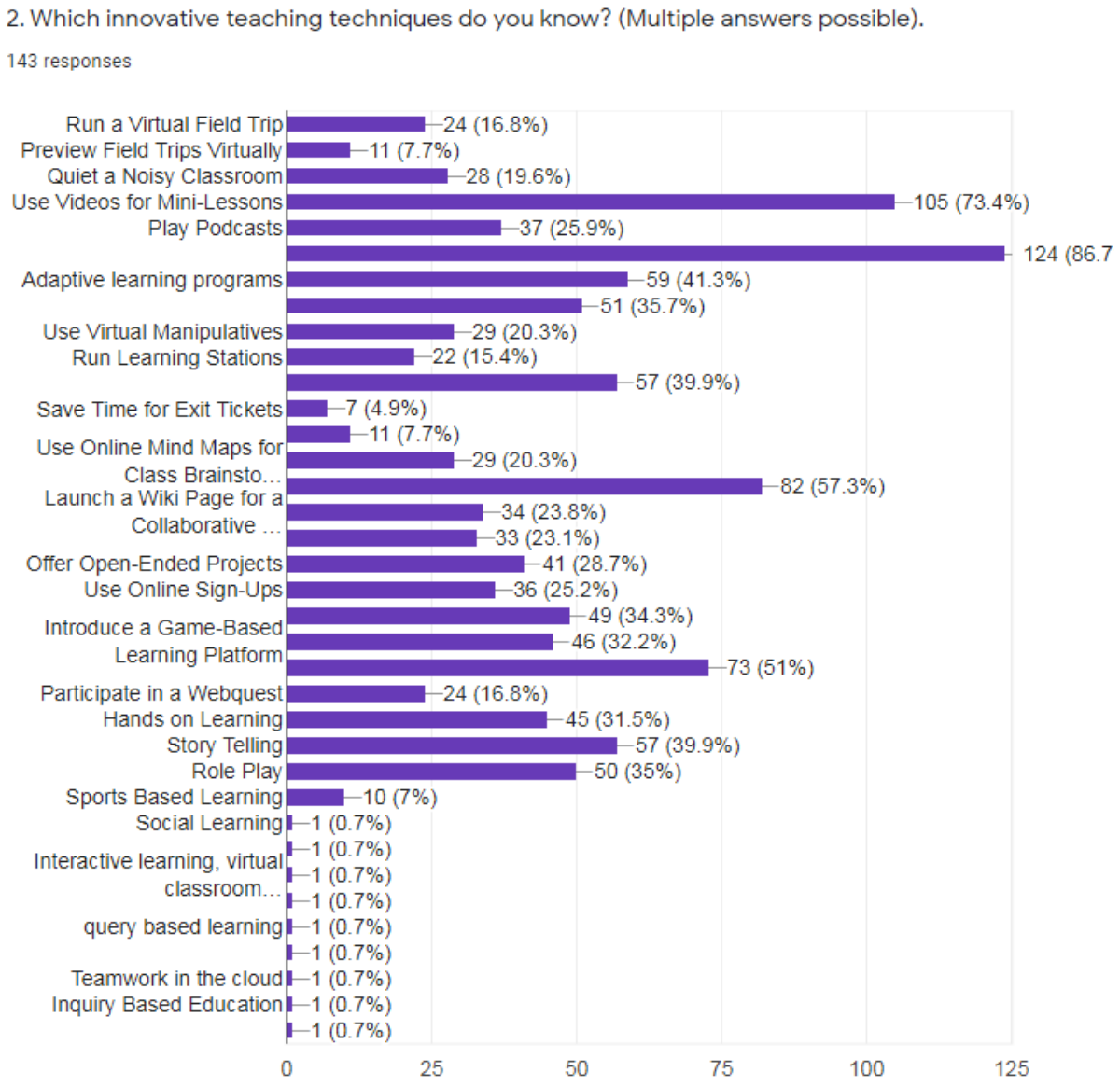
The same questionnaire in 2020 we received 140 responses out of 149 to the question which position the questioned person holds at the University in his/her country.
The teaching staff varies from Professors (78) over Postdocs (13), PhD students (13), other lecturers (20), Technical support (1) as well as 1 Unit Coordinator / Project Manager.
Also 1 Investigator (Pedagogical staff) and 1 Research Scientist gave their answers.

### *4.2 Teaching methods, approaches and techniques (part A of questionnaire)*

Coming to part A of the questionnaire we asked how important teaching methods and / or approaches for ideal results in education are to teachers.



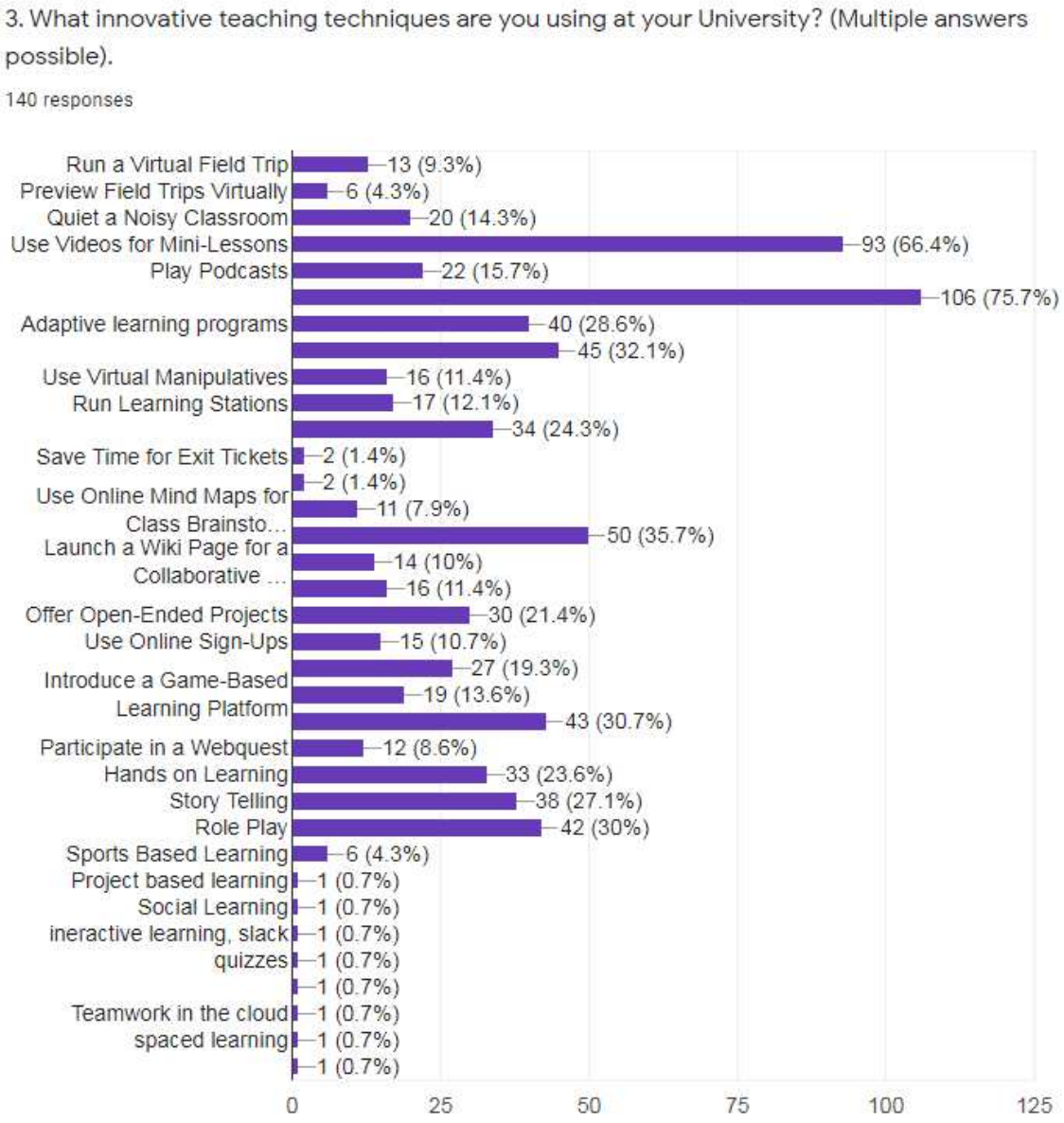

*Out of the 142 answers to this question all found that the methods and approaches are important or even very important in order to reach perfect results in a classroom.*




*Also, the knowledge of different innovative teaching methods seems to be high. Most familiar were people with using Multimedia Elements to in presentations (86,7%) followed by showing videos for mini- lessons (73,3%).* Others know techniques are mentioned:

- Structured Explorable Explanations; Built-In-Spaced-Repetition (c.f. Mnemonic Medium by Nielsen & Matuschak);
- Online-Real-Time checking of exercises (e.g. CARNAP for logic); Problem-based learning; Discovery Learning; Task-Based Learning; Project Based Learning; Learning Contracts; Context-based learning; Flipped Classroom; Social Media.

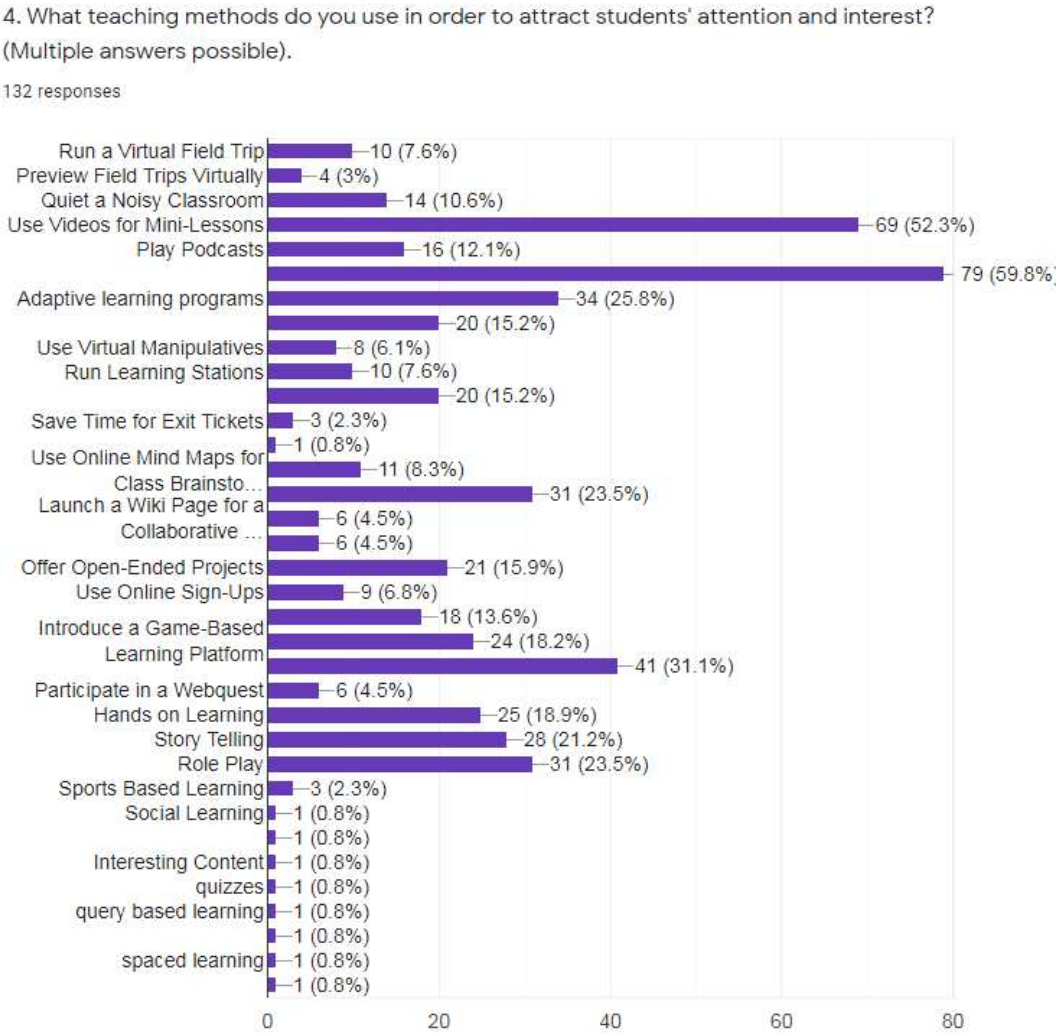
- Inquiry Based Education, Virtual educational Environments
- Developing informatics tools for decision support;
- Scrum based learning




*The most common and most used methods seem to be using Multimedia Elements in presentations (75,7%).*

It was a discrepancy though between the knowledge of teaching methods and their use. Many methods were well- known, but not used, like using virtual manipulatives or running different learning stations in one lesson. Nowadays because of pandemic situation more and more online technique are using what is visible from updated questionnaire where used video mini-lessons are used by 66,4% of responders. There is increase of other techniques such as:

- Various elements of Inquiry Based Learning;
- Explore informatics tool to decision support;
- Scrum based learning;
- Webinars, Online Seminars, Online Teaching;
- Spaced learning is changing topics and types of activities to fight boredom.



The used methods of our European teachers to attract their student's attention (question 4) were even thinner. It seems that the ways to draw attention to the lesson is getting less variable even though it is surprising to see that still quite some teachers are aiming at pleasing their students. Peer-assisted learning has been mentioned by one person as additional teaching method he/she uses. Peer Assisted Learning involves students (typically from the year above) facilitating discussion sessions for students from the year(s) below. It has the potential to benefit new students' transition into Higher Education and enrich their learning, by involving students who have relatively recently gone through the transition process themselves. It can aid both subject understanding and act as a platform for developing students' academic literacies and skills.

In updated questionnaire version we received 132 answers. Distance learning is rising in the time of pandemic situation. Used video lessons rose just after using multimedia elements in presentations just above 52 percent. Learning platform, role play, gaming and adaptive learning program are important in the specific situation in 2020 when distance learning is preferable way of teaching in many states in EU during lockdowns. Other specific ways of attract students were mentioned such as:

- Peer-assisted learning;
- Gamification;
- I am not a teacher, but in the project I coordinate we work with teachers from all fields of knowledge and degrees and the methods used have to take into consideration many variables, and answered in Q3;
- Scrum;
- Spaced learning is changing topics and types of activities to fight boredom.

5. Which teaching techniques are, in your experience, the most beneficial and purposeful for student learning (including the ones that do not exist at your University)? Why?

94 responses

- Role Play;
- Nowadays, it is important students' engagement in class, their experiences and ways of learning. One of the most powerful instruments is Virtual reality;
- Hands on learning. Learning by doing is task-based and goal oriented and keeps students engaged in the learning process;
- Adaptive learning programs;
- Our university has not introduced any to its lecturers, so n/a;
- Practical projects;
- All the techniques that imply an active and collaborative learning of the student;
- Use videos and simulations - very attractive techniques;

- I believe role play, storytelling, using videos and providing additional online activities are some of the most beneficial for students, as they can be really engaging and rewarding for those who take part. This increased engagement helps them form a better understanding of the material and greater retention of the information;
- Peer-feedback in writing;
- Interactive course assignment, because then the students are "creators" and professors facilitate their work;
- Learning in a social network group, project based learning, flipped classroom, research based learning;
- Students must be engaged. Involving them with frequent feedback and in the presentation of arguments;
- Running virtual lab stations with demo programs and short video lessons;
- Embedded quizzes in online presentations;
- No idea;
- Hands on learning as it requires students' full involvement;
- N/A;
- During my lessons, I have successfully experienced student engagement through simple anonymous tests and interactive games. I try to keep the attention high by preparing well-finished, colourful and illustrated slides; I also experimented with the use of comics. I have verified that these experiences are indeed memorable;
- I use role playing and students opinion is positive to that technique;
- There different techniques;
- Hands-on, Assignments, Problem-based learning, Flipped classroom. Because they force students to work and research problems themselves. Using innovative ICT based technologies also raises students' interest during classes;
- Solving Exercises (online/offline); Spaced Repetition (If possible); Lectures (video/live); Answering questions (live); Other fancy techniques often don't work and only produce the illusion of learning, however they may be useful in fostering interest and as a way to showcase applications;
- Depends on the learning goal;
- Adaptive learning programs, because they can be tailored to the specific skills and needs of the specific student;
- Interactive methods. The front ones are not so useful;
- Add multimedia elements to presentations;
- Gamification;
- Game-Based Learning Platform;
- Explaining the content in a way that students understand why it is useful;
- online platforms, video lectures;

- Interactive, involving active students participation, with highlighting links to real-world examples, use of learning platforms such as Moodle for sharing of learn material and exercise service;
- individual approach, gamification 40 % increasing the effectiveness of learning, game approach;
- all techniques are appropriate because they develop creative thinking and enable creativity;
- PBL, role-playing/simulation, debates, flipped classroom;
- Mind Maps and Simulations. The students are involved directly and can provide fast feedbacks;
- Project-based learning and hands-on assignments, because students have to be deeply involved;
- Team projects of any kind, hands on experience, gamification, learning by doing, giving students opportunities to choose their own passion topics for their course work;
- Student peer reviews, Quizzes, Brief feedback methods;
- Play Simulations, Add Multimedia Elements to Presentations, Use Videos for Mini-Lessons
- Innovative education technologies;
- Query based learning. It plays on the curiosity of the student and trains their independence;
- Learning by doing;
- I adopted it years ago and my Computer Vision course gain a number of students 3 time higher than previously;
- The choice of techniques depends on a number of variables such as the studied discipline, the type of class, the learning aims, the students' abilities, the lecturer's preparation, the available resources so there is no definitive answer in my view;
- The most important techniques are related to direct communication, because it cannot be replaced by technology;
- Again, I believe that this will very much depend on a set of variables such as subject, course content, class size, etc.;
- If it comes to e-learning, I find it awful and I would not recommend any teaching techniques in this case;
- Tasks for students during a lecture, work on projects, development of problem situations, discussion methods, activity, shared experience, feedback, new roles, a new approach to the construction of curricula and programs, specific environment,
- Well-structured learning material which is shared with the students in a learning platform, e.g., Moodle;
- case studies;
- Provide Online Activities for Students Who Complete Work Early;
- Hybrid education (hybrid e-learning);
- Mix of lessons and laboratory activities;

- I think there isn't a single answer for this question. It depends on the course, on the particular students, on the teacher abilities and on the teaching conditions available. In my case, I teach programming and I find the adaptation to students' competences and a very good student-teacher communication the most important aspects. Probably, if I had a different course and/or different students I might give a different answer;
- VIDEO LECTURES. Students can attend from any place and review at any time. Online submissions. They can make it easier for students to arrange their time;
- Use Videos for Mini-Lessons; Play Simulations; Play Simulations. They are easily perceived by students and close to the real practice;
- Game-Based Learning Platform. Every student prefer to learn by playing;
- It differs from student to student. Some learn better by listening, some better by reading, some better by doing. In general all methods including an active integration of the students are the best;
- Online quizzes;
- Blogs, wikis, videos;
- Cooperative learning because it allows students to work together independently;
- The complex techniques are appropriate;
- Teaching techniques that allow the student to practically test things;
- Video presentations, visualizations, role play, case studies;
- Game-based learning;
- When teacher acts as a moderator who prompts the students to discover for themselves the new knowledge;
- Motivation of theory by practical applications;
- Storytelling;
- Adaptive learning programs, Hands on learning;
- Videos and simulations help to explain several aspects of teaching programs;
- In Computer Science, I find project based, flipped and scrum based courses to work best;
- Run a Virtual Field Trip - running ultimate teaching experience;
- Solving real cases;
- Story Telling,
- Anything that develops autonomous learning;
- Play simulations, for the active role of the students;
- Such techniques that involve independent learning and creative tasks;
- Play Simulations;
- All demanding active learning;
- Adaptive learning programs and include multimedia elements to the presentations;
- Project based and experiential learning;
- Quiet a Noisy Classroom;
- Learning by doing;

- Flipped classroom approach could be promising. I have no experience in this but I would like to try it in the future;
- A Game-based learning provide an opportunity to visualize the theory and develop the imagination, and open-ended projects develop creative thinking;
- Those engaging students (typically, multimedia and online participation);
- Multimedia Elements to Presentations;
- I don't know;
- A combination of synchronous and asynchronous teaching and learning;
- Hands on learning;
- The following innovative teaching methods give good results for our students - inclusion of multimedia elements in the presentations, work in the electronic environment of the university - Blackboard platform. It would be useful to include Play simulation, but at the moment we do not have such options.

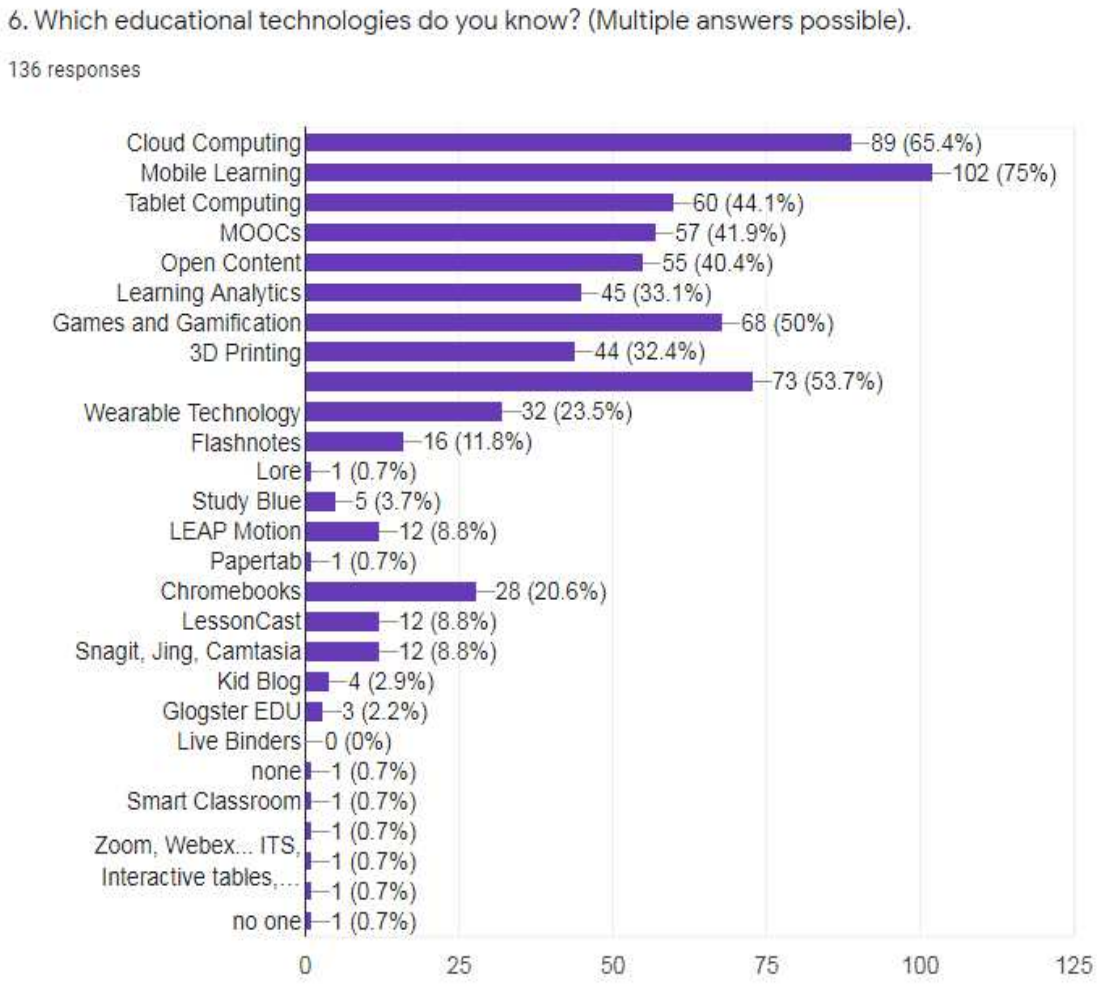
*We received 132 answers to the 5th question on which teaching techniques are, in teachers experience, the most beneficial and purposeful for student learning (including the ones that do not exist at their University) and why they think this is so?*

Some thought that it is well structured learning material, which is shared with the students in a learning platform, e.g., Moodle. Others mentioned gamification as the best technique to teach a class.
Another answer was the adaptive learning programs, because they can be tailored to the specific skills and needs of the specific student as well as explaining the content in a way that students understand why it is useful.
Also mentioned was that all the techniques are useful that imply an active and collaborative learning of the student and that hands-on learning is perfect since it requires the students' full involvement.
Other saw the problem on finding the right technique more difficult. For them there isn't a single answer for this question. It depends on the course, on the particular students, on the teacher abilities and on the teaching conditions available. For one specific person, who teaches programming finds the adaptation to students' competences and a very good student-teacher communication the most important aspects.
Also mentioned were giving assignments, a problem-based learning and the flipped classroom, because they force students to work and research problems themselves. Using innovative ICT based technologies also raises students' interest during classes.
Interactive learning, involving active students' participation, with highlighting links to real-world examples, use of learning platforms such as Moodle for sharing of learning materials and exercise service seem to be important to teachers as well.

*Most respondents declared to have a good understanding about the importance of using adequate teaching methods and tools in their courses. There is a widespread knowledge about several methods and technologies that can be used in educational settings. Some of them are being used in the respondent's universities to create a more stimulating learning environment. The use of multimedia elements in presentations was particularly mentioned. Some difficulties were also stated and there is a general concern to consider the concrete course and students characteristics in the choice of the pedagogical methods and tools to use in each case.*

*There is evident the need of all online techniques in the time of virtual classroom. Special challenge seems to be to keep students attention and concentration for studying. Gamification of education takes important role. Main focus lay on keeping high level of creativity of the students.*

### *4.3 Educational technologies (part B of questionnaire)*

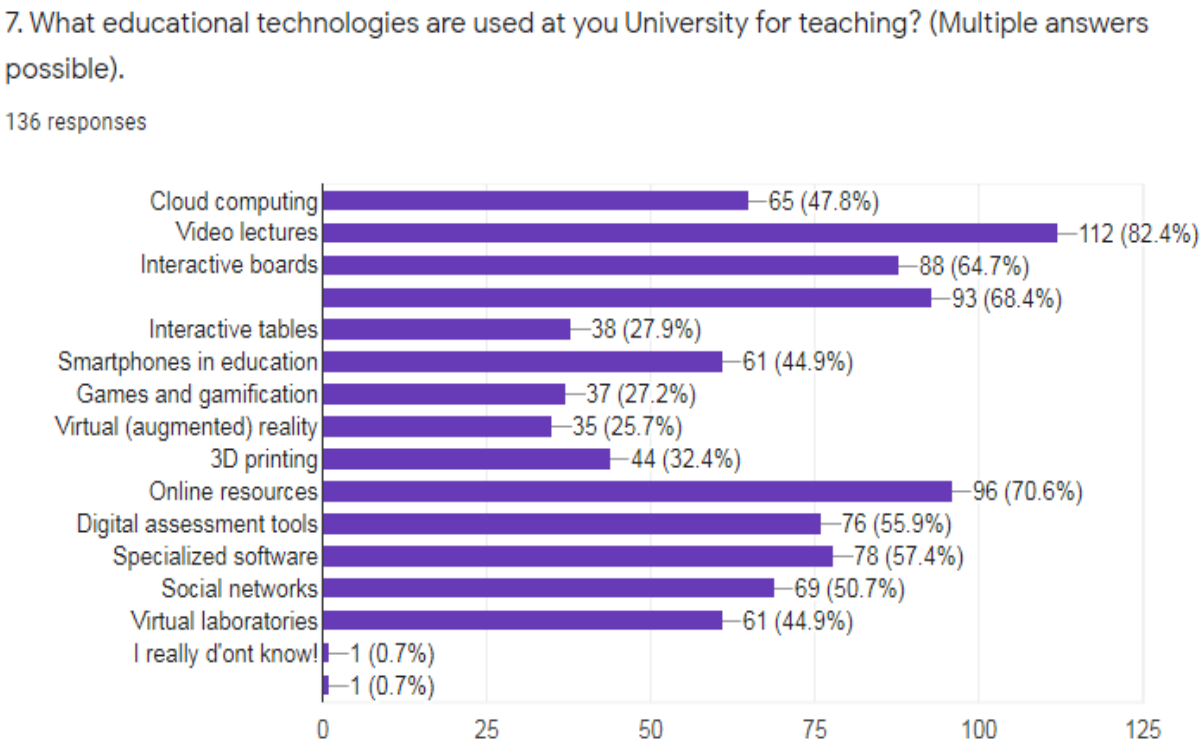



*Looking at the technology side of teaching we gave a variety of 22 examples on different technologies that can be used in a classroom.* It was possible to mention further that might be known, but no one mentioned any beyond the given list. Games and gamification are the best-known technologies, followed by mobile learning.
Some technologies like Lore, Study Blue, Chromebooks (google), Kid blog, Glogster EDU and Live Binders were not known at all.

*Mobile learning becomes the most know technology 75% followed by Cloud Computing 65,4%, Virtual and Remote Laboratories and Games and Gamification in the second round of gathering opinions.* Some more technologies were mention in comments such as:

- I wish our university provided some training on any of the above;

- There are many education technologies that can be brought into teaching, beside the ones mentioned: voting or real-time testing systems like Kahoot; LMSs like MOODLE, Blackboard, Etc.); Programming like Scratch, Augmented reality and virtual reality; digital badges; online surveys; etc.;
- Peer grading, Slack, Scrum tools.




Surprising were the answer to this question, what technologies are used at the different Universities. *All technologies proposed in the questionnaire seem to be used in the Universities as well. This is a good sign that Universities try to go with the new trends and adapt to technologies that students are familiar with in their everyday lives.*

In the second round of answers some more educational technologies were mentioned used by Universities:

- Communication channels (slack, teams, telegram, ...);
- I have identified some; however, there may be more at use by teachers;
- Online resources; Cloud computing; Smartphones in education;
- Slack, Scrum tools.

8. Which of these technologies have proven to be the best in your opinion? Why?

92 responses

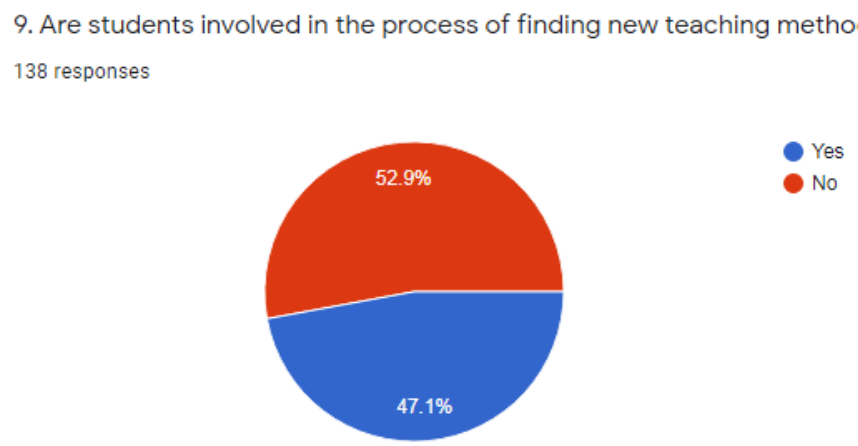
- Interactive multimedia materials;
- Video lectures;
- Online resources;
- Virtual (augmented) reality - students has the opportunity to learn in details and solve complex tasks with better experience;
- The technologies work in an articulated manner, and their suitability depends on the purpose they are used for. For presenting theoretical concepts and frameworks, video lectures are adequate and effective, but for hands-on learning, virtual labs are ideal;
- On the actual context, the video lectures seem to be the best way to improve the study;
- Games and gamification, they make the learning process very interesting;
- Virtual laboratories;
- Virtual environments;
- Online resources have proven to be the best because they provide students the option to revisit everything they learned in class and do so at their own pace. They also present an opportunity to provide more advanced students with additional challenges;
- Social networks, because students know and use them outside classes;
- Games, because then the students learn by doing;
- Interactive presentation systems, virtual laboratories, social networks, video lectures, digital assessment tools, gamification, specialized software;
- Virtual laboratories and short video demonstrations;
- Video lectures, because everyone can choose their own pace;
- Online resources and specialized software, because of their availability;
- Video lectures and online resources are indispensable in times of pandemics;
- Combination of these technologies will be very interesting to students;
- All of them contribute. It is best to use a variety and alternate them;
- Depends of the learning goal, a technology is not good by itself, but only if it used purposefully;
- Video lectures: while simple (in principle), they are very flexible and provide the student with a "learning/teaching" experience similar to that provided by in-presence lectures;
- Virtual laboratories;
- Specialized Software, Virtual laboratories;
- All that will not distract the student;
- Virtual laboratories; Specialized software;
- On line resources;
- Online sharing of slides and exercises, online platform for interactions with students. It's a modern and convenient way to interact and share material;

- Virtual laboratories - they train good way; gamification;
- Other, because a new way of teaching and learning is being introduced;
- Online resources and interactive methods;
- Interactive multimedia materials and virtual laboratories, because they allow students to experience some scenarios that they cannot otherwise;
- Video lectures. Students can follow in detail the process of solving problems in High mathematics;
- Gamification and specialized software tools;
- Smartphones for instant feedback; specialized software for topical learning;
- Video lectures, Interactive boards, Interactive multimedia materials, Virtual laboratories;
- The higher the level of interactivity, the higher the respective tool's efficacy. Gamification is a method which yields wonderful results;
- It is best to combine technology depending on the specifics of the discipline;
- There is not a single answer for this question as it depends on variables such as course content, subject, class size, etc.;
- Interactive multimedia materials;
- Specialized software, Virtual (augmented) reality;
- Online resources. Thus, the students have the right material for learning;
- Video lectures because of their interactivity;
- Virtual laboratories - students can learn at any time from any place. Same for online resources and Cloud software;
- Online resources; Cloud computing; Smartphones in education;
- Games and gamification; Virtual (augmented) reality; Specialized software;
- We mostly have to use MOOCs;
- Video lectures, allow remote teaching;
- On-line resources;
- Video lectures, Interactive boards, Digital assessment tools;
- Video lectures, because are more attractive;
- Digital assessment tools, because they allow students to test themselves autonomously;
- Video lectures, online materials, because students may use them after class also;
- Game-based learning;
- Virtual Laboratories. They allow the students to learn by doing and to grasp experimentally deep mathematical ideas;
- Video lectures;
- Interactive boards;
- Interactive multimedia materials;
- Interactive tables;
- Smartphones in education;

- Virtual laboratories;
- Interactive boards, Online resources;
- Videos and simulations for conceptual understanding;
- Slack is very useful for certain purposes;
- Online teaching combined with video lectures and social networks interaction;
- Online resources. Can be used at any time;
- Specialized software;
- Interactive learning materials, online resources, specialized software;
- Interactive multimedia materials, games;
- Gamification;
- Interactive boards;
- Specialized software are good for students for learning the concepts studied on the books in another way;
- Virtual Laboratories;
- Interactive multimedia material, as (if well implemented) it allows students to more easily understand concepts and procedures, both theoretically and practically;
- Cloud computing;
- Interactive multimedia materials and Smartphones in education;
- I had good results with online materials and live interaction using Slack;
- Virtual laboratories;
- Interactive boards. The main objective is to create a learning environment in which students are actively engaged in the teaching-learning process;
- Best turned out to be interactive multimedia materials, specialized software, and virtual reality.

*We also asked in question 8, which of these technologies has proven to be the best in teacher's opinion and why. The answers varied from online resources to provide the students with the right materials for their studies over specialized software (availability), virtual laboratories, video lectures (while simple (in principle), they are very flexible and provide the student with a "learning/teaching" experience similar to that provided by in-presence lectures) to online sharing of slides and exercises, online platform for interactions with students. It's a modern and convenient way to interact and share material.*

Quite some people mentioned that all technologies are good to use that will not distract the student, but some restrict their answer by making the variety of use dependent on the course and/or students. It has been stated that it is best to use a variety and alternate them.
This shows the openness of teachers towards using new and different technologies in their classrooms.




First responds for this question showed very unpleasant to see that only a smaller portion of the involved Universities involve students in how they should or would like to be taught. Out of the 15 responses, only 40% say that their University involves students in the process.

The ones that do involve their students (40%) do so through general and open discussions and meetings with courses' coordinators. They say that most departments and teachers are open to students' suggestions. Student's organizations have at least one responsible for pedagogical matters that are consulted when major changes are planned.

New round of answers showed progress of involving students in process finding new teaching methods. We received 138 response and already more than 50 % agreed with student's involvement into the process.

We get some answers of the way of involvement:

- Inquiries and suggestions;
- Students' board provides feedback to the teachers;
- Virtual laboratories;
- Ask for recommendations;
- They are directly involved in the process;
- Through participation in research projects or in the form of diploma thesis projects;
- Through general and open discussions and meetings with courses' coordinators;
- Some of my communication students are working with me on the production of unconventional teaching material, such as cards, comics (and videos);
- Students work in teams and they have to teach their teammates;
- Motivation;

- We have a class that tries out Scrum for Education with first semester undergrad students. This involves the students insofar as they are responsible (in part) for finding their own learning methods and evaluating them;
- I talk to them;
- Assigning appropriate tasks during the exercises;
- In developing training resources;
- We have meetings with them, inquiries and pedagogical forums;
- Short interviews and brainstorm sessions about interesting practices they have seen or heard of;
- By giving them a choice of techniques to be used and observing their preferences; by using flipped classroom approaches; by setting up smaller study groups, etc.;
- Surveys;
- There is a strong presence of students in pedagogical boards, where they have an active role in proposal and decision-making. They also make suggestions through the pedagogical survey delivered at the end of each academic year;
- By involving them in research projects;
- Most departments and teachers are open to students' suggestions. Student's organizations have pedagogy responsible that are consulted when major pedagogical changes are planned;
- We involve students in experiments during classes;
- With participation in project and extracurricular activities;
- Surveys and the student delegation in the University council deciding things;
- Ask which type or remote lecture (e.g. recorded or live) they prefer;
- Letting them use the technologies they know;
- Students are asked to provide feedback;
- Asking them for preferences and sharing experience;
- The Games;
- To improve communication;
- Questionnaire;
- They are involved in development of specialized software's;
- Asking them directly to share learning experiences gained outside from their formal study at the University;
- Open discussions;
- By offering them to test some of the new teaching methods;
- With discussions, projects, tasks, surveys, analyses, feedback ...;
- By conversation;
- They suggest different technologies that they like. Students develop and implement their own virtual learning systems and tools;
- By holding discussions;

- It is possible for them to present such teaching methods together with the holders of the respective disciplines.

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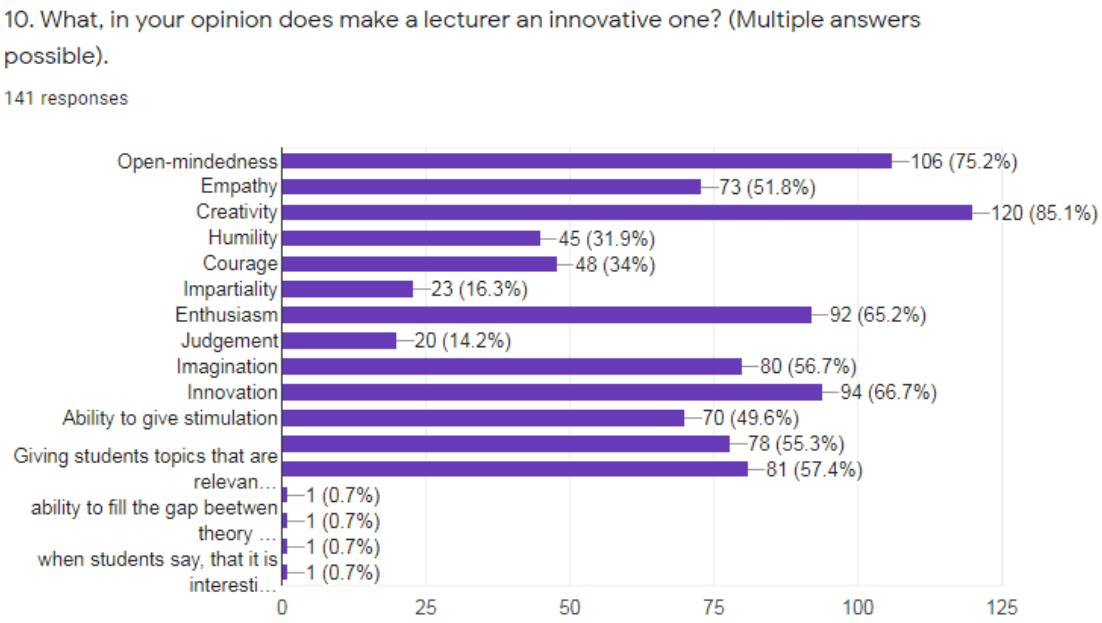
*Respondents showed knowledge about many different educational technologies, being Games and Gamification the most mentioned one. Online resources, digital assessment tools and video lectures are the most used technologies in the respondent's institutions. The answers to the questionnaire revealed that most institutions do not involve students in the definition of new teaching methods, at least in an initial stage.*

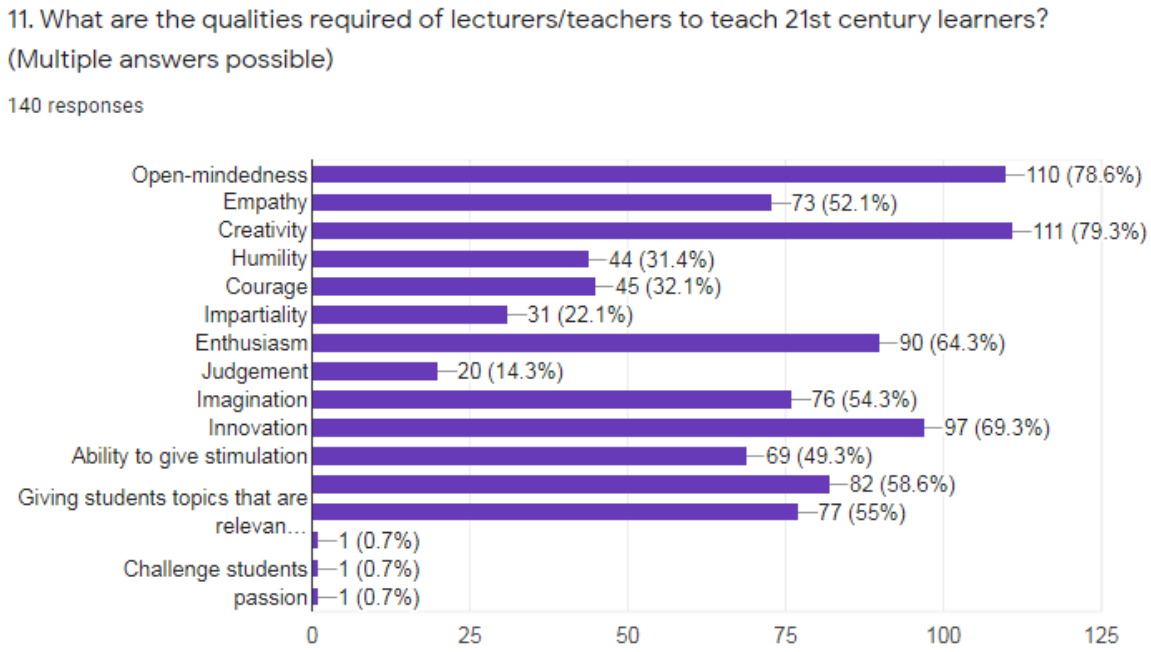
### *4.4. Educator qualities (part C of questionnaire)*




All the 13 proposed answers seem to be relevant in the question about the teacher's innovation skills. Creativity though was with 86,7% of the answers the most relevant skill a teacher should have to make him novel, followed by enthusiasm (73,3%). It is good to see that teachers also find it important to give students topics that are relevant to their lives and future since this is often lacking at Universities as students criticise.

*Creativity plays an important role in the second round of answers (141) with its 85,1% followed up with Open-mindedness 75,2% and innovation 66,7%.*
Between other responds, we received:

- Theory is boring for young people. We must become wizards to combine correctly theory and real practice in order to attract and motivate our students;
- Covid safety;
- Spare time from the many other activities;
- "Giving students topics that are relevant to their lives and future" is a necessity not an innovation;




Giving students an innovative and stimulating environment seems to be the most important feature a lecturer should hold nowadays. Open- mindedness, creativity, imagination, innovation are the points following these skills on the foot.
Not quite as important seem qualities like impartiality and a good judgement.
Other important additional mentioned accomplishments were flexibility, knowledge, diplomacy and the ability to listen.
Some responders describe others qualities:

- Flexibility, knowledge, diplomacy, ability to listen;
- Ability to keep attention (theatre);
- The university needs to compile leading teaching approaches and train people. Of course, time is needed.

*Respondents were asked about educator's desirable characteristics. It is interesting that the most mentioned ones may be connected with the creation of a stimulating student environment (creativity, relevant topics to the students, enthusiasm, and so on).*

### *4.4 Status of Innovative teaching in higher education classrooms (part D of questionnaire)*

12. How is, in your opinion, the current status of today's teaching? Is it innovative enough?

123 responses

- Yes;
- No, it isn´t;
- It is not innovative enough;
- It's still be a teacher-centred teaching;
- It is innovative enough;
- Today's teaching is noticeably stagnant and recent trends are fairly alarming;
- Yes, it is innovative enough;
- It tries to be. More efforts should be put on;
- What is innovative enough? The process is ongoing and innovation in teaching has a slow evolution. Now is evolving faster, also due to the technological advancements in e-learning;
- Yes in some subjects, courses and departments. It depends on the lecturer him/herself;
- It depends on teacher's abilities and personal qualities;
- It's good even if it's not innovative;
- The pandemic made it necessary to adopt telematics tools; this has contributed to making teachers more aware, compared to the recent past, of the possibility of innovation;
- During Covid situation I think that many teachers find innovative techniques to teach their students;
- Almost;
- It is innovative, but not enough. Majority of teachers do it the traditional way;
- Status: Pretty horrible (during Covid pandemic); Innovative enough: Depends, some innovations are useful to explore, but many are done without a theory guiding the innovation. Almost always there is too little time & resources to guide and frame any innovation in teaching;
- Not innovative enough, especially our professors (old white men) are bad teachers;
- I think that the level of innovation of today's teaching is still rather low (innovation requires much time and efforts);
- Teaching in our country is developing in accordance with global trends;
- I think that the status is not innovative enough. It depends on teacher motivation to use innovative teaching methods. When the student see that, their teacher is motivated and try to use innovative methods they are more motivated. The students always notice teacher's

positive attitude to the class activities and try to do their best for such a teacher. The most important for every good teacher is to use the latest modern technologies in class. There are some motivated teachers and they use innovative teaching technologies, but they are few;

- It is innovative enough;
- Medium;
- Not necessarily. Teaching staff needs mainly to do not teaching related activities. This comes at the price of reduced quality of teaching;
- It is not innovative enough. The teachers have to deal with many extra works and no concentrate to their main tasks. The lecturers at the universities are busier with writing articles than preparing interesting, useful and interactive lectures;
- No. It's much teacher centred and students have some difficulties in assuming a more participative position. Students do not always know how to use autonomous working time;
- No, we are still too constrained by traditional and out-of-date methodologies;
- Much is still based in old methods and it is not enough innovative;
- It needs a lot of work to be more effective;
- Not innovative enough; high-quality teaching is barely supported by the research system at universities as it does not contribute to the key performance indicators that are used to assess a researcher's quality. So it does not make sense to invest a lot of time into teaching if that time is actually not honoured (maybe even harmful);
- Today's teaching is moving in the wrong direction. We move more and more away from education towards training skills;
- Yes, it is innovative enough;
- At a fair level;
- It is and it is getting better;
- I think we cannot generalize. I believe some very interesting practices are taking place in HE but there is also space for improvement. I believe it depends on the context, mainly;
- It is in a process of adaptation and still not enough innovative;
- It depends on the teacher;
- To some extent yes, but there is much to be desired;
- Sometimes, it is too innovative... Unfortunately, the people often think more about if the teaching is innovative or not. But, they forget to think about the students themselves and the quality of teaching... More innovative teaching does not definitely mean high quality of teaching;
- Not enough;
- No, no enough innovative;
- I do not think that "innovative" is the most important keyword. Teaching can be innovative (in the sense that it is different from the usual), but very bad. Also, can be traditional and very good. The opposite is also true. In general I think that most teachers still use traditional approaches and, in that sense, teaching could be more innovative;

- It makes an effort to be innovative;
- In some disciplines;
- No, by far not. It is standard teaching mostly. Maybe sometimes smart boards are used or classes given online, but that is not innovative teaching It is the teachers mind that has to be more innovative and not only the technologies;
- Not yet but this period is accelerating learning new approaches;
- I think it can be improved. Many things are being introduced, however even more can be done;
- Very good;
- Generally, yes;
- No, it does not correspond to the needs of the society (today's and the future one);
- Could be improved;
- Must be improved;
- Yes, there are many interesting approaches all around;
- Is at a good level;
- It is innovative but it can be better;
- Too innovative. We start to forget the "good old ways";
- May be too much. Innovation mustn't be an absolute;
- It has started to become innovative fast;
- 40 %;
- Not enough;
- In the engineering areas, I think it is. In the humanitarian areas could be improved;
- It depends: technologies for innovative teaching are available, but their use is often at a very basic level;
- I think it is enough;
- There are very different cases. I would say that we are forced to move to innovative solutions, even because of the remote learning forced by the pandemic;
- Yes, innovative teaching methods are increasing, but we must learn to apply them properly;
- Innovative teaching methods are widely used, but there can always be more.

13. Looking at the previous question, what is still missing?

94 responses

- Enough money for education;
- Flexibility;
- Time to explore and select the best options. Teachers and students need time to curate information and tools in order to not feel overwhelmed;
- Involvement of students in the learning and on the teaching process;

- New technologies in education;
- Application of new AI technologies;
- More internet training;
- The question 11 qualities;
- There is always room for improvement;
- Enthusiasm, creativity, love teaching;
- Innovation in teaching methods and techniques;
- Missing enough modern hardware;
- The number of new educators in the field seems to be decreasing with each year. We need fresh perspectives and younger people who are able to keep pace with the new generation;
- More education in intellectual property rights, especially how to obtain own trademark;
- Many academic staff representatives need more enthusiasm and courage to try new teaching approaches; some technologies that could support innovative teaching are still too expensive;
- Comments: I see some students that do not react to stimuli. It is difficult to involve them, it would be easier to dance into TicToc than doing teaching in the classroom and capture the attention of the full audience;
- Stimulation for professors, acceptance from community, activeness from students;
- Education in new fields of techniques and innovations;
- The innovator must invest a lot of time; teaching is not rewarded for career purposes;
- Time and effort to do it most of the times. You can have the will, but many times you do not have the time. Also, some resources can be hard to buy or have available;
- There are new tools but few know how to best use them. Examples are needed. Teachers have to invest time but don't have enough financial incentives;
- I think that still missing young teachers. In each university there is a need of young teachers with fresh ideas;
- Enthusiasm;
- To know more about that;
- Skills, equipment, HR;
- To introduce the technologies and methods in practice;
- A structured approach to "evidence-based" learning and the possibility for experts (in teaching and learning) to provide input and feedback for teaching strategies;
- Empathy, courage, and time;
- Proper motivation (teachers/professors are not properly rewarded for their teaching efforts - no salary increase, no better evaluation of their career);
- There are no effective methods of interaction;
- I think that the Education system today need more motivated teachers and more innovative teaching methods! Digital generation’s students today find the classes boring. They need more innovative teachers;
- Directed to game-based learning;

- Creativity and innovative approaches in teaching;
- I am not sure that innovation in teaching is as important as its quality. An excellent teaching could be based on old "blackboard" methods;
- Time is missing :), also calmness, sense of humour and satisfaction. No enough respect to the teachers' work, they are not encouraged by the society and supervisors;
- So many Educational technologies to learn;
- New digital competence programs;
- More collaborative work between teachers and students and more pedagogical active methods;
- Having an open mind, accepting the new challenges of the XXI century, always is as if you are starting your career, not having anything for granted;
- Giving students an innovative and stimulating environment. Giving students topics that are relevant to their lives and future;
- People with more enthusiasm to teach, and students, willing to learn;
- Teaching positions that allow for the evolvement of good teachers;
- Determination;
- Structure. The questions are long lists of single word answer mixing technologies with brand names and names of specific teaching methods. Honestly I got lost in the questionnaire and my answers do not reflect my way of teaching;
- More hands-on training for lecturers to help them go deeper into the affordances of digital technologies suitable for their own classrooms;
- Education of professors about new technologies and methods;
- One of the things that may contribute to more innovative teaching may be an investment in the Continuous Professional Development of Teachers;
- Teaching knowledge and material in schools:
- It is not a matter of technology! Motivated teachers and qualified university professors are missing;
- Preparation and motivation;
- I think universities should stimulate more teaching quality. On the contrary, teachers are stimulated to teach as they always did and spend most time with research. When I say teaching quality I don't mean using lots of technologies. I mean using whatever is necessary to motivate and help students to learn;
- Enthusiastic students and teachers;
- All professors/teachers should use interactive methods in all disciplines;
- Teaches need to move to the new teaching century and start going much more into contact and interaction with the student. They need to be part of the group and start to think innovative and act like that as well. I think a big part of this is about being empathic;
- Clear guidelines;
- The student should be stimulated to be;

- More active and autonomous;
- Teachers should be educated about new possibilities and technologies;
- Education in extreme pandemic situation;
- Sometimes is difficult for lecturers to be up to date with the latest changes in economy, technology and society;
- A more flexible administrative framework to allow for the implementation of new methods of teaching and assessment;
- The students want to be active participants in the educational process. Not only to listen, memorize and reproduce but to understand the connection behind the known facts;
- Lack of infrastructures (a decent Internet connection to support video streaming);
- Imagination;
- Putting theory in practice;
- Open-mindedness, Creativity;
- Implementation of "new procedures" and possibilities;
- Sharing of knowledge;
- Access to innovation;
- The skills to choose technologies wisely;
- Budget;
- Access to and affordability of advanced technologies;
- New approaches in practice (2, 3, 4, 6);
- Tools are too many, computers and equipment’s are not enough, teachers and lecturers are not ready and do not like to improve their teaching methods;
- Innovative teachers;
- Make the learning more focused on students;
- Humanitarian studies should be more experiential, less dogmatic and less theoretical. More creativity should be encouraged in the students, more community projects should be initiated so that the students can learn by doing;
- Conservative and silo thinking prevails. This should be changed;
- The methods and technologies used so far are not innovative at all;
- Proper training of teachers, to make them understand the potential of new technologies;
- Innovative education technologies;
- Fairness;
- I think that most of the younger teachers can deal easily with new technologies. Older teachers are usually experiencing more difficulties with new approaches. Thus, for some years at least, this gap should be filled somehow, if possible;
- Good planning and coordination;
- In the present, nothing is missing. But teaching is always changing due to new realities. Teachers have to change/innovate their teaching methods frequently, either in the use of new technologies or in the way they transmit knowledge to students;

- Better teachers/students ratio;
- Additional training of teachers is needed for the implementation of innovative learning technologies.

*The 12th and 13th questions tried to find opinions on the status of today's teaching and if it is innovative enough and what is still missing.*

Surprising answers like that "sometimes, it is too innovative "reached us. Someone mentioned that it is unfortunate, that the people often think more about if the innovativeness and forget to think about the students themselves and the quality of teaching. More innovative teaching does not definitely mean high quality of teaching. The teaching should still remain more "teacher-cantered".

In opposite to that, others mentioned that the current status is not innovative enough and that it depends on the teachers' motivation to use innovative teaching methods. When the student see that their teacher is motivated and try to use innovative methods they are more motivated, claims one of the responders. He also says that the students always notice the teachers' positive attitude to the class activities and try to do their best for such a teacher. They also claim that he most important for every good teacher is, to use the latest modern technologies in class. There are some motivated teachers and they use innovative teaching technologies, but they are too few only. The answer, that the level of innovation of today's teaching is still rather low (innovation requires much time and efforts) compliments this view.

"Innovative" is here the most important keyword. Teaching can be innovative (in the sense that it is different from the usual), but still be very bad. Also, it can be traditional and very good. The opposite is also true. In general, it is said that most teachers still use traditional approaches and, in that sense, teaching could be more innovative.

Also, a reason for maybe the lack of innovativeness in today's teaching was given. Teaching staff need to do too many non- teaching related activities. This comes at the price of reduced quality of teaching.

Often it is a lack of time to deal with new methods and technologies, to introduce the technologies and methods in practice. Also, some resources can be hard to buy or have available.

Teachers should be given better motivations (teachers/professors are not properly rewarded for their teaching efforts - no salary increase, no better evaluation of their career).

Universities should stimulate more the quality of teaching. On the contrary, teachers are stimulated to teach as they always did and spend most time with research.

In the lecturer's opinion, today's education system needs more motivated teachers and more innovative teaching methods. Digital generation students find the classes boring. They would need more innovative teachers.

But it remains unsure, that innovation in teaching is as important as its quality. An excellent teaching could be based on old "blackboard" methods.

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*Status of today's teaching*

*The idea that teaching could be more innovative is quite common. The main reasons for this lack in innovation are: i) teachers are not sufficiently motivated to use innovative methods; ii) often, teachers pay more attention to the adoption of the latest modern technologies rather than to their impact on students and to the actual quality of teaching.*

*Current innovative activities*

*Innovative teaching does not definitely mean high quality of teaching. Nevertheless, digital generation students recognize teachers' positive attitude to class activities and try to do their best for such teachers.*

*What is still missing*

*Universities should invest more on the quality of teaching. New methods and technologies require teachers' efforts and time. Teachers are not properly rewarded for this from both the economic and career viewpoints: teaching quality is not considered at the same level of research quality. Moreover, teaching staff has often to carry out many different kinds of activities.*

### *4.5 Quality assurance of the teaching and learning process (part E of questionnaire)*

14. Do you let your students evaluate your lectures? Why / Why not?

126 responses

- Yes;
- Yes, learners' feedback is always a good source for corrections and further improvements
- I will. It is really helpful to know how to improve yourself, what kind of information your students missed and what are "the gaps" in the way of teaching;
- Yes. Criticism fosters improvement;
- Yes. This is a requirement at the university;
- Yes. It is mandatory in my University. I also think that it is very important for me to know their opinion about the lectures;
- No. No reason. Maybe I will give them such option;
- Yes, to improve the future lectures;
- Yes, because this allows to improve the learning context;
- Yes, it is a technology of our university;

- I let students evaluate my lectures
- I do not, because I do not believe I would receive accurate actionable feedback from my students;
- Yes, because their feedback helps me improve teaching in the future;
- Yes, there is a protocol for it at our university;
- Yes, I need to know how efficient and useful is the material I provide;
- Yes, my institution ask them to do it;
- In common, sense - NO. They are evaluation more the results not the content and they are not appreciating if the content is difficult;
- We use feedback but trying to remove questions regarding evaluation of the personality and the results;
- Yes, I need their feedback for next lessons;
- It is a standard procedure by the university;
- Yes, because I like to know what they think about it in order to improve it. But in my case it is also part of the university policy;
- Yes, it is a standard protocol at my university;
- Yes. Theirs opinion is very important for me and I read carefully every feedback to improve my lectures;
- Yes, but not just lecture. The whole course and way of teaching and evaluation.
- Yes. To improve lectures, so see which strategies work and to change the lectures on the fly
- Yes: without students' evaluation, no real assessment of teaching quality can be carried out;
- This is a very good idea;
- Allow the most active students;
- Students objectively evaluate the quality of teaching and lecture material;
- It is ruled by the university;
- Yes, this is often required by the university. Also for application for other positions it is required to submit evaluations;
- Yes, I do. This is feedback. :);
- Yes. It´s an usual methodology at the my university;
- Yes. It's important to have feedbacks to improve future editions;
- Yes, because they are very critical about everything and provide us with valuable inputs;
- Not necessarily, sometimes they share their impressions without asking them;
- Sometimes, if we have the time. I ask what was most interesting, and what was most boring;
- Yes. It's mandatory. Also, I'm interested in that feedback;
- It is done by my university. I consult the results. Further, I ask students for honest informal feedback;
- It is done by the Department;

- Yes. Getting feedback from students is important to plan how to improve my own teaching and make it more meaningful to their needs and expectations;
- No;
- At our University, we conduct a Pedagogical Survey where students have an opportunity to evaluate lectures and lecturers;
- Yes. The feedback is very important;
- Yes, why not, after pre-playing role-playing games and relevant assessments;
- Yes. This is a requirement of the university;
- Yes. Feedback is important for me;
- Yes. That's my university policy. All courses are evaluated by its students;
- No. They evaluate only how easy it is and how attractive. They do not evaluate the contents and usefulness until they start work in the business;
- I do;
- Yes, so that it can improve;
- Yes, feedback from students allows improving constantly the quality of teaching;
- Yes. It helps me to improve my teaching;
- Yes, because their feedback allows me to improve;
- Yes. In my university (and I think it is the same in practically all Italian universities) the students have to evaluate teachers and lectures;
- Yes, because it is important for me to improve;
- There is no formal evaluation that I require from them. They can do this within the system of quality control of the university;
- This is done obligatory by the educational institution;
- Yes, because I need some feedback. I cannot monitor myself while teaching;
- No, because the evaluation is strongly influenced by the capacity of understanding and motivation of the student, it cannot be impartial;
- Yes. We have a Quality Control system implemented;
- It's part of my University regulations;
- Of course I do. The students have to evaluate the way they are taught;
- Yes. To increase empathy;
- Yes, to receive their feedbacks;
- Yes, because this is the most way to meet their requirements and answer their needs. Also, this is a good way to self-improvement;
- Yes, this the way to improve teaching and learning;
- Yes, it is mandatory;
- Yes, I want to improve the lectures and myself;
- Yes. It's a standard procedure in my university;
- Of course, every time;

- Yes, it's done by default in our institution;
- By conducting surveys;
- Does not apply to my case;
- Yes, the feedback is important;
- Yes in the form of surveys. Feedback is needed.

*We wanted to know in our 14th question if teaching staff let's students evaluate their lectures and if yes, why they do this and if not, why not.*

Some answered by just saying that they do so, without giving any explanations.
At some Universities this seems to be a requirement.
Other teachers do so since there is no real assessment of teaching quality without students' evaluation and this allows to improve the learning context in the classroom.
Also, for application for other positions it is required to submit evaluations at some Universities.

15. What instruments/techniques do you use to do this if the answer is "yes"?

110 responses

- Surveys;
- Online surveys;
- Questionnaires;
- Online questionnaires;
- Inquiry;
- May be a questionnaire;
- Polls;
- One direct discussion and one incognito online assessment sheet;
- Institutional platform (Nónio);
- Online inquires;
- Quest and conversations;
- Different platforms;
- Online surveys;
- Surveys, official and internal;
- Institutional evaluation;
- Satisfaction assessment questionnaire;
- Surveys are conducted with students;
- On-line anonymous questionnaires;
- Personal discussions, surveys;
- Questionnaires, but they are not well done, so the consideration of the results is very low;
- Online feedback and anonymous polls;

- Surveys and open meetings;
- The university provides specific questionnaires. I also try to have direct feedback in class;
- Google Forms Survey;
- Online survey;
- For the most unusual class: bi-weekly questionnaires of about 30-40 questions as well as informal feedback during the sessions. For one lecture: mid-lecture feedback. For one class: Informal feedback during live sessions once a week;
- Online questionnaires. I do my independent in addition to the standard provided by UL;
- Assignment of personal assignments for term papers;
- University provided tool;
- Survey;
- Talking and Survey;
- interactive technologies and methods activating learning;
- All the students have to fill a questionnaire for each course;
- University forms;
- Questionnaires, surveys;
- Surveys, questions, discussions, tasks;
- Inquiries;
- Surveys and dialogue with the students;
- Online Surveys , Google Forms;
- They have inquiries where they can express anonymously their opinions;
- Verbal communication and google forms;
- I have no influence on that and I don't even know the online forms;
- Questions;
- There is a questionnaire used;
- Filling online questionnaire at the end of the course and before the final test;
- Class discussions, including online ones; online questionnaires and polls; written assignments:
- Using questionnaires;
- This is a system of the university. It is not under my control;
- Get feedback from students;
- Surveys in the academic management platform;
- Electronic feedback form, which is built into the web-based course of the course;
- Live discussion, online surveys;
- An anonymous questioner;
- Students do not complain;
- Online forms and questionnaires;
- Special kind of anonymous questionnaires;
- Students have to answer online questionnaires when registering for their exams;

- Feedbacks, discussions;
- Depends on the organization;
- Direct feedback, speaking with them;
- Student questionnaires managed at faculty level;
- Answering to anonymous questionnaires;
- AI and normal surveys;
- I ask them during class;
- Questionnaires;
- Questionnaires at the end of the course. Immediate feedback after the class;
- Google Forms;
- Feedback;
- Questionnaire, free discussions;
- Anonymous university surveys;
- Questionnaires;
- Online forms;
- Interviews with students, surveys;
- Talks, surveys, questions, communication, give them to explain new topics;
- Questionnaires;
- Non formal reflections. But I am considering more formal evaluations well;
- Presentations;
- Feedback survey;
- Online questionnaires;
- It is a software implemented by our University Consortium;
- Anonymous survey (Google Forms, Survey Monkey);
- Oral and written;
- Direct communication;
- They collect polls from the students on many aspects of the teaching;
- I ask them what they like and don't like. What are their expectations at the beginning and how much they are satisfied at the end of the course;
- School pedagogical survey;
- Externally managed;
- Surveys are used, as well as tools in the electronic environment of the university.

*Question 15 was asking what instruments/techniques the Universities uses for the evaluation? Some Universities have special systems for the evaluation that is not under the control of the teacher himself like academic management platforms etc..*
*Other teachers use surveys to collect opinions like i.e. online or paper questionnaires or discussions with the students themselves.*

16. What do students complain about the most in the teaching methods your University uses?

95 responses

- Too fast, too monotone and too classic;
- In general, I would say they complain most about teaching that is too theoretical in nature;
- Some (a few number) of the students say that the methods are overly theoretical;
- Each year students fill out anonymous questionnaires and assess the quality of teaching at the University;
- Bored of videos;
- Room conditions;
- Little time for evaluation activities;
- Not enough modern methods;
- I have not heard any complaints;
- Theoretical and unrelated to real life subjects;
- Some of the academics have too high academic language;
- They complain when the lecturer slides a presentation and just reads the text from the slides, when the learning content is obsolete or not engaging, when the lecturer does not show a will to be more flexible in terms if assignments and the organization of the educational process. Our students need a more personalized approach;
- When the content for the exam is not present in the slides I provide them after each lesson they complain and say that the exam is too difficult;
- This happens also if the content is in the class book but not in the slides;
- If the literature is too much and the content is difficult to understand in minutes;
- Clarity of programs;
- The quality of the teaching in general and some assessment issues;
- Generally, the biggest complaints concern the study material, which the teacher does not always care;
- They complain about Mathematics tasks;
- Connectivity;
- Feedback;
- Usually when the too many tasks to do;
- (1) Unusual ("innovative") approaches (2) Online-Only (3) Insufficient Feedback for exercise sheets;
- Boredom, boring lectures, too complex and time-consuming assignments, and this professor's attitude that the students are lazy if they are not prepared;
- Little flexibility (if you miss a lecture, sometimes it may be difficult to retrieve equivalent material);
- From things that are not useful to them in practice;

- Students appreciate innovative teaching methods of some teachers in our University. In our University, students have a tradition each year students to vote online for innovative teachers in every faculties. These voting is very important and shows real students opinion about innovative teachers;
- I have no observations;
- Current complains are mainly related to online problems due to pandemic;
- Amount of material. Too much theory, math;
- They don't understand the complex terms because they don't know the base of the material from the school. Teaching in mastery is needed as a method, also individual approach;
- Students ask for more practice;
- The work load, the pedagogical ability of some teachers;
- That it is irrelevant to the business field;
- I don't know; the results are not freely available;
- Complexity of the subject; speed of the lecture;
- Too many duties;
- Lack of interactivity;
- We cannot generalize this as the methods the University uses, as this differs considering the subject and teacher, however, we may say that some students point out as needing to improve some curricula, resources, teaching methods and evaluation methods;
- More practical less theoretical;
- Some of the professors dictate lectures;
- Not all teachers use electronic forms of training, and specialized software applications;
- A lot of information;
- Too much workload on them;
- Going to lectures and making exams by writing on paper long answers of exam questions;
- Technical issues and lack of experience to solve them;
- Boredom;
- Students do not complain;
- Visual materials;
- Online survey;
- Probably little flexibility;
- Online teaching is not as involving as real one; we miss the full human communication;
- They want it to be more practice-oriented;
- Online materials should be available;
- Have no complaints;
- Boring, old style;
- Lack of contents update, lack of empathy;
- Subjects more related with accommodations and physical conditions;

- Do not complain;
- Hard exams;
- I cannot judge. For languages - the insufficient number of teaching hours;
- Personal work;
- Uniformity, using old approaches;
- The students from last generations have poor vocabulary and do not understand the lectures;
- Quality of connection;
- Monologue;
- They usually complain about the quantity of materials they have to study, which is too much, in their opinion. Sometimes they say that the teacher is not capturing enough their attention;
- They are too much "traditional";
- Old fashioned;
- Not complain;
- My lectures are rather successful, with no major complains at all. I don't know of major issues in other lectures;
- Glitches;
- Access;
- Boring lectures;
- They require more resources from the teachers in the university's electronic environment.

*In question 16 we also wanted to know the biggest complains students have about teaching methods your University uses?*
*The outcome was that students appreciate innovative teaching methods of some teachers in Universities. At one of the Universities asked, students have a tradition to yearly vote online for innovative teachers in every faculty. This voting shows the real opinion of students about innovative teachers.*

*Students complain a lot about too little flexibility (after having missed a lecture, sometimes it may be difficult to retrieve equivalent material).*

*Also, it seems that there is too little time for evaluation activities. The 21st century student is very bound and has a high competitiveness. This makes their workload unbearable in some cases.*
*Still many students remark that the quality of the teaching in general is bad and that they have some assessment issues.*

*They seem to receive too little feedback on their work and studies which means a lack of guidance during their studies.*
*In other cases, the complaint was about the amount of material and that their studies are too theoretical.*

17. What are the criteria for evaluating the lecturers at your University?

92 responses

- A complex evaluation metrics based on both teaching and R&D of the lecturers is used;
- I don't know...may be the way that the information is presented by the lecturer;
- None;
- I don't have the official form with me at the moment, but overall teaching capacities are assessed, and the availability for follow up explanations to students outside class comes to mind;
- We use criteria related to the syllabus, the teaching methods and the excepted learning achievements;
- There is a quality control system;
- Implementation system for quality assessment;
- Not precise enough;
- n/a;
- Official surveys;
- Knowledge, pedagogy;
- Educational and scientific activity;
- Lecturers are evaluated based on their curriculum, the subjects they teach, research they have been involved with, articles they have published, their contributions to improvements to the work of the department and their field and their conduct and ethics;
- A general system of evaluation from students every semester and a peer-review assessment every 3 years, which takes into account research, teaching, administrative duties and extension to the community;
- There are many of them;
- Attestation procedures;
- Questionnaire. Student answer to 10 questions. If they don't they cannot participate to the test. This has the consequence that, since the questionnaire are anonymous, they answer randomly in order to be quick and access to the test booking;
- Students results, content of the course, having presentations and electronic content or not, having books in the filed or not;
- Student feedback;
- The students evaluate them and you have to meet some procedures, like providing information and grades on time to students in our information system;
- Coherence with programs, interest in the subject (this is not very logical because it does not depend only on the teacher), ability to stimulate interest, punctuality, etc.;
- We have attestation procedure and we evaluate our teachers with a complex formula, which includes marks about teaching, research, administrative work, qualification improvement;

- There is internal system for evaluation;
- Students voices;
- Teaching, research, attracting funding, etc.;
- Student Feedback and perceived (by me) Learning outcomes of the students (first: mostly positive; second: mostly awful, especially for master's classes.);
- Well... the standard ones something like "was the professor well-prepared";
- Online questionnaires (about teachers' teaching skills, quality of study material, availability of teachers to provide help);
- Correspondence of the content of the lectures to the world tendencies in the development of the taught disciplines;
- The most important criteria is student's opinion. We have some formal criteria, but I think that this student initiative to vote online is the most important for the evaluation of lecturers;
- The evaluation criteria are based on the accepted and approved rules for academic activity at the university;
- It is a long list of questions and grades that are given by the students;
- Questionnaires, surveys;
- The number of participating students;
- Inquiries to the students;
- The degree of student satisfaction;
- Surveys each semester about the curricular units (e.g., syllabus, teaching and evaluation methods) and the teaching quality of the teacher (e.g., clarity, theory-practice articulation, availability to respond to students);
- They are evaluated based on the teaching, scientific, management and relation to the community criteria;
- Student's performance in exams;
- High/middle;
- Already answered;
- Publications; developing new course content; participation in evens such as conferences and forums; participation in projects; student evaluation of a lecturer's work;
- Teaching quality, course material;
- Quality, relevance and Suitability of Curricula, Teaching Methods, Resources, Evaluation, etc.;
- Assess the academic and scientific work and teamwork;
- Questionnaire;
- Scientific performance (most important), pedagogic performance and management duties;
- Relativeness to business needs, innovativeness, using multimedia, interactivity, science inclusion;
- Erudition, willingness to interrupt the exhibition, clear and understandable presentation;
- Surveys;
- We have an online program of evaluation;

- High;
- Complex questionnaires;
- Online survey;
- Several items (mainly, how much they engage students, how clear their lectures are, how good their study material is, how well the exam modalities are defined);
- To be well prepared with the course material, to evaluate all the components of the student performance, to use fair grading;
- There is a system of quality control where students fill in survey cards;
- Compiling forms;
- Certification system with measurable grades, including surveys;
- Online questionnaires;
- No specific evaluation except for students' questionnaires that do not affect the teacher's career;
- Several aspects from “clarity of exposure” to “time and opportunity to answer to students questions”;
- Questionnaires;
- All the criteria listed in previous questions;
- Scientific competence, systematisation, ability to stimulate debate and clarity of assessment criteria;
- Several (clarity, availability, punctuality, competence, ...);
- Student surveys are used for assessing the efficiency of lecturers
- Quality Commission;
- We have a system for evaluation of the lecturers;
- Knowledge, communication skills;
- Quality of work;
- Outdated;
- Many different: from the teacher to the materials (books, slides) and also about the rooms used for the lectures etc..;
- Based on students' evaluations;
- There are 18 different criteria, from quality of the teaching, availability of the teacher, respect of the schedule, availability of material, difficulty of the course, etc.;
- The criteria are not defined;
- School pedagogical survey;
- Criteria for attestation of teachers have been developed and applied.

*There seem to be some formal criteria, but lectures think that the student’s initiative to vote online is the most important for the evaluation of lecturers.*

*Other important criteria are about teachers' teaching skills, quality of study material, availability of teachers to provide help, etc.*

*The students evaluate them and teachers have to meet some procedures, like providing information and grades on time to students in information systems.*
*One very important criterion mentioned is the scientific performance (most important), pedagogic performance and management duties of the teachers.*
*At some Universities it is important to find out about teachers' qualities in teaching, research, attracting funding, etc.*
*In another University there is a long criteria list that leads to questions and grades that are given by the students.*

18. Do you follow any innovative ways of providing feedback (like survey monkey, google forms etc.)? If "yes", please specify.

97 responses

- No;
- Google forms;
- Yes, google forms;
- Survey monkey;
- Yes, online surveys based on google forms and Moodle surveys;
- A specific platform very similar to google forms;
- Surveys;
- Depends;
- Yes - Google forms;
- Survey on printed papers;
- Google Forms;
- I use a lot google forms. Seldom the tests available in the learning platform of my institution, based on Moodle, but it is more difficult to master, and fit less my needs;
- Yes, but they are not working well. They are too primitive and the students do not like them. They need more attractive design of the polls and feedback forms. Better is to integrate social networks for feedback;
- My university uses online forms;
- Google Forms, Kahoot;
- Yes, Google forms;
- Yes, we have an online survey system;
- In one class: Reshuffle (~5 person) teams based on student feedback; Change the instruction approach based on student feedback (and manpower) Other classes: Standard, only address the feedback in the live sessions;

- The questions are more important that the service;
- Surveys with students are conducted regularly;
- Yes we use survey and also this online students voting;
- Yes, google forms, Kahoot, quizlet, learningapps, quiziz, surveys in Moodle;
- Usually not;
- If it is necessary I will do it;
- Yes, google forms;
- Yes, I use quizzes (topical and non-topical) in the lectures;
- It is an online form. However, I wouldn't consider it as innovative. Why are these brands particularly innovative?;
- Yes, the LMS used at the university offers a tool for creating questionnaires, Google forms and Microsoft form;
- Nónio (the Universities Academic Management Platform);
- Activities related to the specific discipline;
- Questionnaire;
- I ask my students to write quarterly reflections on the classes, their learning difficulties and so on. This is made in our university academic platform, through" Diary" functionality;
- Sometimes, but we prefer internal platforms or Moodle. Survey monkey and google forms look like the survey is made by pupils and our students are criticizing the view.
- Surveys in Moodle;
- Yes, survey monkey, google forms, qualtrics;
- Yes, usually Google forms;
- I reach my students by e-mail, WhatsApp and ZOOM;
- Yes, AI based chats;
- Yes, google forms;
- It is a standard not an innovation;
- Yes - survey monkey, Office 365 Forms;
- Yes, both survey monkey and google forms;
- I use Google Forms for polling information when necessary;
- Yes, Google forms;
- Yes, I use survey monkey;
- Yes, but not individually; as a member of the school's Pedagogical Council, I try to monitor the elaboration/alteration of the pedagogical survey carried out every semester by the students;
- Yes : lime survey;
- Yes, we use surveys as well as google forms.

Some use questionnaires in surveys and online students voting.

One lecturer asked his/her students to write quarterly reflections on the classes, their learning difficulties and so on. This happens in the university academic platform, through a "Diary" functionality.

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*Status of today's teaching and learning process evaluation*

*Universities have systems for teaching and learning process evaluation by questionnaires and online students voting. Some of these processes are not under the control of teachers themselves; for others, instead it is the teacher who accomplishes surveys to collect students' opinions. In any case, it is recognized that this activity allows improving the learning context in the classroom.*

*Student's complains about teaching methods*

*Students complain about limited program flexibility, limited time for evaluation activities, limited feedback on their work and studies, which means a lack of guidance during their learning. Also, sometimes the amount of study material is excessive and very theoretical.*

*Criteria for evaluating the lecturers*

*The list of questions and grades given by the students for evaluating lecturers includes: teaching skills, reflections on learning difficulties and pedagogic performance; research and scientific performance, funding attraction and management capabilities; quality of the study material, availability of teachers to provide help and periodic reflections on the class.*

### 4.6 Continuous professional development of teaching staff (part F of questionnaire)

19. Do you think that the present curriculum of lecturer education serves the needs of present-day schools and Universities? Why do you think so?

93 responses

- Yes;
- Every day have new good practices for education and the best way to serve the needs is to learn, read and be innovative in every aspect;
- No. 20 years ago, a teacher-centred blackboard approach has been used , but today, this is largely outdated;
- It depends on the programs/universities. In the master program I am involved with, I think we dedicate quite a bite time and effort to training novice teachers in innovative educational strategies;
- Yes and no. In terms of academic knowledge, the curriculum is suitable but, it is necessary to improve the methods of teaching in order to keep up with the students and to include innovative methods of teaching;
- Lack of enough technical knowledge;

- No, can be adapted better to the needs;
- No. Curricula are still very scientific, not including contents in the context of methods and teaching and learning techniques;
- Roughly;
- I believe the present curriculum is adequate;
- No, because it is a 20th century curriculum, with too much emphasis on content learning and not enough attention to learning processes;
- Yes, because our professors and students have good communication channels;
- No, the school teachers and university lecturers need to constantly develop their digital skills and literacy as well as to be familiar with the most popular innovative teaching methods;
- I don't know;
- The curriculum of Technical universities is relevant to the future need of engineers but the student are attracted to easier ways of getting to practice. Nevertheless, engineers will not solve only common problems and they need to know fundamental sciences to meet future needs;
- Yes, because there are university classes for lecturers and control of the technologies;
- It is probable, but not immediately;
- No, because the word is changing very quickly and you have to adapt at a fast rhythm;
- Yes, I believe fundamental knowledge is passed on to students;
- Universities needs young teachers with fresh ideas;
- Yes, on every two years almost all curriculum are updated;
- Sometimes yes;
- Needs improvement;
- I cannot say;
- Don't know enough about it to comment;
- I am not sure that all our lecturers had a training in that. Curriculum: depends on the university;
- Partially (few lecturers know how to use the currently available new teaching methods);
- I cannot answer;
- Basically match;
- I think that lecturers have to study and to follow the trends and students interests;
- The curriculum is prepared and corresponds to the normative documents, which regulate the training process for the respective specialties;
- Only partially;
- No, Lecturers are selected mainly on their performance of project acquisition and, possibly, publication record. Teaching, unfortunately, plays a very small role;
- No, is does not. Too many theory and less practice, this leads to less motivation. Learning by doing, problem based, project based etc. are needed;
- maintains active research and teaching activities;

- Teachers;
- Not really;
- I think it can be improved by considering new advanced technologies, including virtual labs and cloud computing;
- No, they need to have some training on pedagogical methods and also on technology;
- Yes, because it is updated regularly;
- It needs to be more dynamic and student involved. More team projects, more hands on learning, more self-learning;
- A greater emphasis should be placed on the variety and flexibility of the employed teaching methods;
- Largely yes;
- No, totally;
- No, I do not. The reason is low connection of education with practise;
- Yes, but it requires more effort on the part of learners and trainers;
- It depends on the lecturer. Some lecturers structure their teaching program very well and are always up-to-date with any new methods/approaches from their field;
- I think university teachers pedagogic training is necessary and should be mandatory for new teachers;
- Yes. Making the education too attractive will not lead to better results in specific subjects - medicine and engineering are not games;
- Contemporary dynamics require continuous self-improvement, especially teachers;
- No, they need to think further;
- In principle yes but not all teachers care about CPD;
- No. We should discuss the way we are teaching and create a new learning model;
- No. The scientific domain is so dynamic and lecturer needs permanent re-education;
- No, not so much. Only their scientific qualities are evaluated for teaching positions, not teaching qualities;
- There is room for improvement, but above all it is up to the educators themselves to look for ways to make teaching better;
- No. Lecturing is oriented toward giving facts (many of them easily reachable in Internet) while students want to learn by experimenting;
- For Universities Lecturers and Professors there is no mandatory didactic courses;
- No, too old style;
- No, it is too limited to traditional concepts;
- The main subject (formation) corresponds to present days needs but there is a need to update other communication and technological skills;
- Yes, wide scale of possibilities for advance teaching methods;
- Yes, but we need more innovative and interactive methods;
- Sometimes;

- Yes, there are enough webinars on teaching improvement locally and internationally;
- No. More practices are needed, as well as integrated knowledge. Many topics are repeated in different subjects but could be combined - teach liquids, for example, from all perspectives - chemistry, physics and etc. during one unit;
- As a matter of fact, no curriculum of lecturer education exists;
- No, more training would be necessary;
- I don't have a position on this;
- To some extent;
- Yes. Teachers are always involved in various activities, in addition to classes, which enrich their curriculum;
- At present, the current curriculum for teachers is not sufficient to include innovative teaching methods and should be further developed.

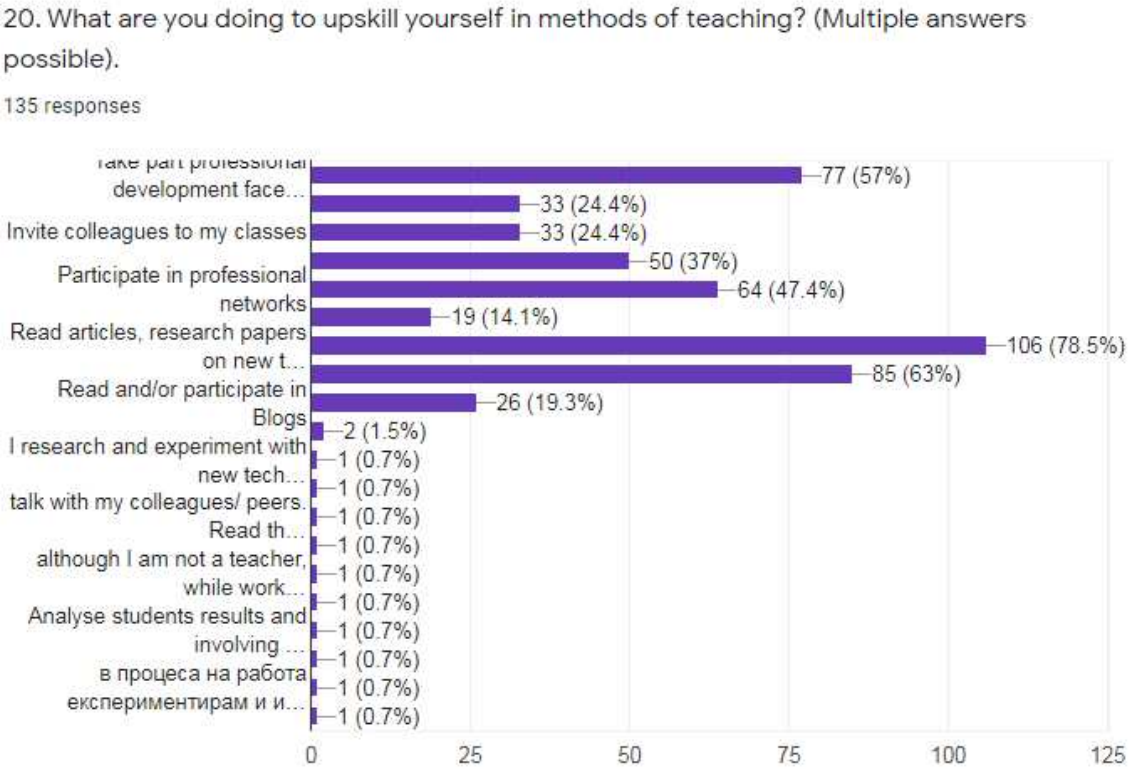
*The second number 19 asked if the teachers think that the present curriculum of a lecturer education serves the needs of present-day schools and Universities and also wanted to know their opinions on that.*

*Many lecturers had no real answer to this question. It seems there is too little interaction between different lecturers.*
*Of course, it depends on the lecturer. Some lecturers structure their teaching program very well and are always up-to-date with any new methods/approaches from their field, but lecturers have to study and to follow the trends and students interests.*

*Only a few lecturers know how to use the currently available new teaching methods.*
*In general, curricula are still very scientific, not including contents in the context of methods and teaching and learning techniques. The world is changing very quickly and lecturers have to adapt in the same way, which is not possible many time due to lack of time and resources.*
*A University teachers pedagogic training would be very necessary and should be mandatory for new teachers.*

*Also, lecturers are selected mainly on their performance of project acquisition and, possibly, publication record. Teaching, unfortunately, plays a very small role.*

*Here again it is shown that the interaction between teachers is not very good. No one ever invites colleagues to their own classrooms or works with a mentor to evaluate their methods. Also, no teacher is seeking information by creating his/her own blog to search for other lecturers that have the same problems/doubts/difficulties as they have.*




The most common way to improve their lectures seems to be the student surveys as well as reading and studying research articles and papers.

Teachers that do research on Computer Science Education include research results in their teaching methods, which of course is a big advantage they have to those, doing research in other areas.

Responders specify some answers to question 20:

- I research and experiment with new techniques myself;
- I communicate with my colleagues face-to-face, on-line and off-line also;
- Although I am not a teacher, while working with teachers as a coordinator/manager I believe a lot of teachers I work with are committed to upskilling themselves. I have identified some methods I myself invest on as professional development to work with teachers and students;
- My research is on Computer Science Education. So research results have been included in my teaching methods;
- Analyse students' results and involving in projects;
- Get ideas from social network links and experiences;

- I cannot answer;
- Each year, I usually try to improve my work (as teacher) updating my subjects and exposure to students reactions and novelties and developments;
- Exchange of ideas with colleagues.

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*Needs of present-day schools*

Technology evolves very quickly and teachers have to adapt according to the technology rate, and this is often difficult due to lack of time and resources. Teachers should follow new trends but considering students' interests.

*Status of the lecturer education*

Lecturers are selected mainly based on their performance publication record and on project acquisition. Teaching, unfortunately, plays a limited role. Pedagogic training including contents on methods and on teaching and learning techniques should be required for all teachers and particularly new one.

*Development of teaching staff*

It is fundamental that teachers willing to reorganize their teaching programs and curricula considering new technologies work cooperating each other, of course considering progresses in their specific teaching field.

## 5 CONCLUSION

It is obvious that Universities need to invest more in the future technologies. This is not all though. Teaching methods are equally or even more important than using the newest and best technologies on the market. Teachers need advice and good methods to attract the student's attention in today's classrooms. Technology is a good trigger, but the best technology does not help without the application of very good teaching methods. Teachers have to start being more open minded to new methods and also Universities need to find a good strategy to help their teaching staff to up rise a new, 21st century digital generation.

We appreciate involvement of 149 responders while running questionnaire second time. It is clearly visible the answers are made during Covid pandemic time. Situation, where nearly all schools provided higher education have no other chance just to teach virtually and communicate with colleagues and students using all tools for online communication. We can also notice change of the mind of teachers for innovative methods of teaching. Confrontation with new pandemic

situation speed up process of finding best way of teaching and securing higher education with producing more online content, development of virtual classroom and laboratories etc. It is high probability that methods developed and already used nowadays will be essential part of Higher Education in the future mixed with social and personal contacts.

## 6 List of Figures



## 7 List of Tables



## 8 Document Templates

## DOCUMENT TEMPLATES

### ANNEX 1
### ANNEX 2
### ANNEX 3
### ANNEX 4