dante

Digital Area for Networking Teachers and Educators

How to Communicate with Students In Digital Education

DANTE PROJECT GUIDELINES

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1 Introduction: Roadmap of the guidelines

One of the aims of the DANTE project was to develop new solutions that could support the communication in the digital environment while teaching. To develop the proposed solutions we have applied various methodologies, to revise the opinions, ideas and suggestions of the students and teachers from the partner Universities, to identify the potential areas of concern in digital communication (in particular those that emerged during pandemic) and the possible routes to its improvement. We have also revised the existing academic literature (and the empirical evidence within) to track the communication styles that have been confirmed to be efficient in the digital environment.

Our findings within have been twice a subject of the discussion with the partner Universities.

Based on this work, we developed the final set of guidelines to address the proper communication tools and communication styles, to enhance the learning outcomes in digital educations.

Roadmap of the guidelines

- Attitude
- Communication styles
- Attention
- Technology

SYCHRONOUS COMMUNICATION

- Guidelines for teachers
- Guidelines for students
- Templates of the written on-line communication (e-mails)

ASYCHRONOUS COMMUNICATION

GUIDELINES

communication tools and style for digital education

DIAGNOSIS

Screening the literature and empirical works on communication in the digital teaching environment

(desk research)

Case studies analysis:

Which channels of digital communication are used at partner Universities?

Survey at partner Unis:

Quality of communication skills and satisfaction from communication channels used

2 Guidelines on synchronous digital communication

2.1 Teacher's attitude in digital communication

Many believe that in digital education the critical issue is the choice of the adequate platforms, application of appropriate teaching tools or remaining interactive while presenting the content of the lecture. However, contrary to the appearances, the most important in synchronous on-line communication is the attitude of the lecturer (the sender of the communicates) towards the students (the audience and the receivers of the communicates). The screen remains a critical barrier in this process, but it could be overcame by some activities that may potentially arouse positive emotions between the lecturer and students, as well as among the students as the listeners. These activities are helpful in establishing good relations in the digital classroom.

Below, we provide a list of useful guidelines that have a power to enhance the good attitude of the students in on-line teaching:

Use icebreakers in the virtual world

Help students to feel more relaxed in the first part of the meeting. Don't create additional barriers to contact. Icebreaking activities enhance the development of students' social skills and avoid a feeling of isolation in the virtual classroom.

Some examples of icebreaking activities:

Example 1: Ask students: Which GIF best captures your mood today/your attitude towards the class?

Example 2: Create a word cloud with students in response to a question, e.g. What is your dream job? What is your dream vacation spot?). Use Aha Slides app, for instance.

Listen when students speak

Listen when students speak, listen to the person actively, and show respect for the student's different opinion.

Use a student-centered learning approach

Encourage collaborative discussions and teamwork between students.

Teach students to give feedback to each other – the feedback that strengthens and develops, not diminishes the other person.

React

React when you notice signs of passivity, boredom, misunderstanding, or even agitation in verbal and nonverbal communication.

Monitor the conditions and possible constraints

Consider that students may have different conditions for studying during online lessons. For example, they may not want to turn on the webcam or microphone because of their accommodation or roommates.

Also, keep in mind that for introverted people, the situation of having to turn on the camera and being seen by others throughout the class can be stressful. Introverts are more likely to join the class using audio-only.

Show your involvement

Be present, and don't disappear from the screen for long! Be ready to answer students' questions even if they are doing individual work or working in separate teams.

Empower the students

Ask students for their opinions on the changes that can facilitate their learning.

A sense of empowerment makes them more motivated to work and aware of their influence on the shape of the class.

Highlight the benefits

Discuss the specific benefits that can be gained from each activity.

Reward

Praise students often, also for small achievements. Praise them for their response, even if the answer in your question is not correct, find out why the subject matter was not understood and patiently explain it in another way. Reward their joint collaboration.

In the forum: highlight good statements made by students during online discussions or when summarizing discussions. Provide quotes from students, refer to specific comments made by individuals, and thank them for speaking up and expressing their opinions. Every student who engages in the activity must receive feedback from you from time to time. Students will feel that their involvement is noticed and appreciated, and they will be motivated to continue working in virtual class in an active way.

Admit mistakes

Admit mistakes, show that you are not infallible, as this increases students' liking for you as a person and shapes student behavior.

Revise the content

Carefully analyze and revise the content you want to convey in class, to increase the effectiveness of teaching. Information and work overload influence the students, including the worsening of their mental health!

Keep your motivation for work high!

Be in touch with your colleagues, advise each other how to solve both the psychological and technical problems. Do relaxation activities and remind yourself of the benefits of working from home.

2.2 Communication styles

For boosting the efficiency of communication in digital education, we should consider the types of the personalities of our students. Ideally, the lecture should be organised in such a way that each information is repeated in the style that reaches the attention of each student, by respecting the features of his or her personality and the related abilities to receive the information. Below we provide some guidance on some simple solutions that are easy to implement while on-line teaching. These guidelines demonstrate the wording teachers' may use to reach the attention of students, given their sensitivity or personality

Communication style vs SENSES:

To reach attention and understanding of the students that perceive communicates with different senses, try to repeat the content several times, by using different words/expressions that attract the attention of visual, auditory and kinesthetic learners:

To help the VISUAL LEARNERS

use words and phrases associated with seeing, e.g.:

"Look, ..."   *"See, ..."*   *"Clearly see"*   *"It is clear"*   *"Notice that..."*   *"It illuminates..."*

To help the AUDITORY LEARNERS

use words and phrases associated with listening, e.g.:

"Listen,..."   *"Hear"*   *"Sounds good"*

To help the KINESTHETICS LEARNERS

use words that refer to feelings, e.g.

"I feel that..."   *"I have an impression..."*   *"You can feel..."*   *"I have a sense that..."*

Communication style vs PERSONALITY:

While communicating with students, try to repeat the content in various ways, to reach the attention of the students of different personalities. The hints below refer to the Hartman's Color Code Personality Profile:

RED - personality is motivated by power

The red personalities are power takers of the community, logical and determined. Emotions are unimportant to decision making process, they are vision and task oriented. They are active, dynamic, hardworking and like competition.

How to communicate with REDs?

- Focus on the purpose of the speech,
- Create short messages,
- Show data,
- Adopt task-wise approach the topic.

BLUE - personality is motivated by intimacy

For blue personalities life is a sequence of commitments, they survive on personal relationships, are always looking for ways to sacrifice personal gain; they are perfectionists, often go emotional and are susceptible to mood swings; they are disciplined, demanding of themselves and others, like governance.

How to communicate with BLUEs?

- Be detailed,
- Present charts.
Be prepared for questions.

YELLOW - personality is motivated by fun

Yellow personalities are fun lovers, motivated by having a good time, enthusiastic and spontaneous. They find friends easily but often are self-centered. Life is the party for yellows. They are enthusiastic about new challenges, talkative, first act, then think. Show a broader perspective, spread a vision, speak energetically

How to communicate with YELLOWs?

- Show a broader perspective
- Spread a vision
- Speak energetically

GREEN - personalities are motivated by pace

As the peacemakers they will do anything to avoid confrontation, want nothing more from life than to feel comfortable and thus happy. Essential for them are interpersonal relations, they are emotionally sensitive, value calmness, good listeners, empathetic.

How to communicate with GREENs?

- Ensure a good atmosphere when speaking,
- Be natural.

Show understanding and support.

2.3 Reaching attention of the virtual audience

The attention of the audience tends to decline after 15 minutes. Thus, it is important to plan some "interventions" while the on-line lecture, to attract the attention of the students.

The ability to attract and maintain attention and concentration among students is essential. It is necessary to react if the attention and concentration is declining, observe the group, and notice symptoms and fatigue signals. Concentration during remote learning is much more disturbed and difficult to maintain. The attention of the audience tends to decline after 15 minutes. Thus, it is important to plan some "interventions" while the on-line lecture, to attract the attention of the students. For instance, teachers need to change the rhythm of the speech, introduce a different method, a modification the message that will arouse the interest of the audience again. While building the dynamics of the class, teachers should keep in mind the shape of attention curve of the audience and try to obtain the model of efficient presentation. Below we suggest what activities teachers could implement as interventions, to keep the virtual audience attentive and concentrated.

Typical curve of audience attention: the importance of interventions
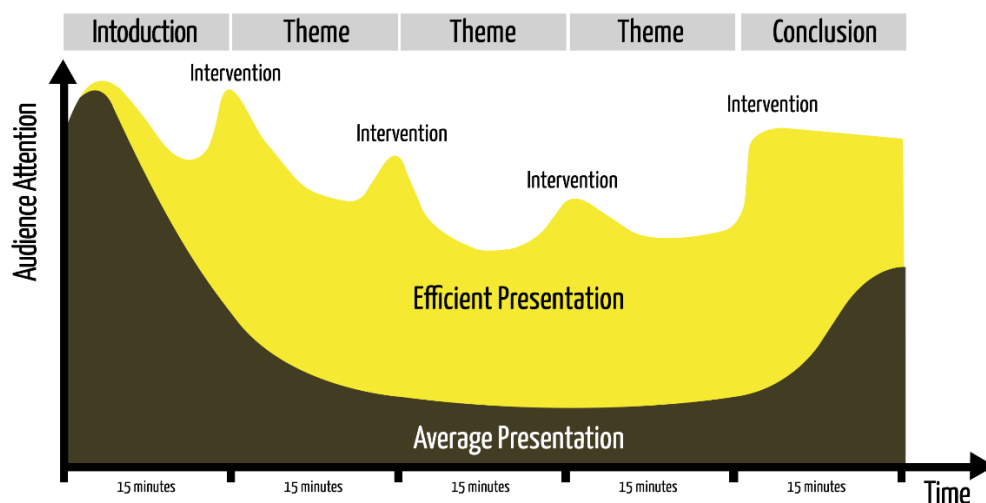
Source: J.W. Niemantsverdriet,, 2000

- As the beginning is important, begin with small talk that is funny and surprising. Later on, during the lecture, remember that humor, jokes, positive emotions always help to remember the content. Apply surprise strategy – try to attract students' attention by presenting statements that contradict students' knowledge or views.
- Devote a few minutes to share information on what is happening with others and referring to current events and situations.
- During the lecture, try to engage the students' logical thinking, as well as their emotions and imagination.
- Use gamification elements engaging in tasks – think of both simple solutions, and those more complicated as well (e.g. Moodle platform allows to give students badges for achieving specific goals).
- Arrange a work on a project for which the student is fully responsible in the long term (with constant contact with the teacher), such as full-semester projects.
- When applicable, arrange work in small groups online (if the group is large – you may divide it into smaller groups).
- Try to implement storytelling as the learning method – this method incorporates the taught content into a story that stimulates emotions and imagination; the story can span one lesson or can be told throughout the course.
- Include exciting facts related to the given topic, inspiring examples of application of the taught content in practice.
- Invite guests - practitioners, people who will also be known to the students (example: YouTubers, influencers, podcasters in a given field).
- Use of various forms of communication: suggest material to read, but also videos to watch, multimedia presentation with audio effects.
- Learn about and then implement the methods that activate both the left and the right hemispheres of the brain - a variety of methods for working with students.
- Follow the recommendations of experiential learning, that starts from a case study, a problem, so that the student gets involved and independently builds the knowledge needed to solve the issue.
- Offer yours (teacher's) and try to get feedback from the students (apply learning activities that allow providing feedback, by using constructive criticism, and the ability to receive it).
- If possible, divide the lecture into shorter units and do the breaks in between.

The power of technology

The COVID-19 pandemic has sharpened our awareness on how important are the technological aspects in digital education. In a relatively short period of time, both the teachers and the students had to face and overcome technical constraints that were influential on the efficiency of digital communication. Poor technical solutions remain influential on the quality of digital communication, even if the teacher is skilled and opened to use various technical solutions.

Choose the learning platform that helps to meet essential criterial of communicativeness

- Learnability - i.e., ease of navigating the platform, clear layout,
- Memorability - ease of use of the platform, so that after a more extended period of not using the tool, the user can quickly get back into it,
- Errors - if the user makes a mistake, she/he should be able to quickly return to the state from before the error,
- Satisfaction - the platform should be designed so that it gives satisfaction from usage.

Use discussion boards

- **Wordwall** - to create your own materials with exercises tailored to the group,
- **Jamboard** - a tool to help with brainstorming when students are generating ideas, prioritizing,
- **Mentimer** - a tool that helps in the evaluation of classes

Use other digital tools and solutions

- Canva - for creating mind maps, presentations, visualizing topics.
- Video, photos, infographics, audio commentary to the presented content; short videos of written text.
- Engaging, interactive presentations, using Genially type tools.
- Work on a shared document, e.g., on google disc - so that the student can show what they changed, what was their contribution to the work.
- Recording of lectures: research has confirmed that students prefer recording lectures (pre-recorded and attaching files on educational platforms or YouTube), so that they can listen to the course at any time, repeatedly listen, which increases the level of understanding of the content

3 Guidelines on asynchronous digital communication

3.1 How to write e-mail to students?

#1. On the first meeting, inform the students on what you request while in contacting you by e-mail. Clearly present your expectations – for instance, on how to address you, what is the tone of the messages you accept and do not accept, how students shall identify themselves while writing to you (what you request to identify the student easily, e.g. identification of the subject or cycle of studies etc.).

#2. Be brief but informative: clearly highlight of what should be done and what is the deadline. You may implement the system of reminders to help students to follow the deadlines.

#3. Remember to give your e-mail a proper subject, so that the students will be able to easily identify the issue/problem you address.

#4. Use the right tone – make sure that your text keeps the tone you wish (either professional or enjoyable)

#5. Always re-read your message before sending it to your students – make sure that it is clear and communicative.

#6. Respond to the students' e-mails without unjustified delay. Inform your students in advance on how long they should wait for your answer, to avoid someone spamming you with reminders once a day.

#7. Motivate and stimulate – as the students are learning from a distance, you should monitor their efforts and stimulate and motivate them when needed. It is worth to regularly remind students about the tasks and duties, as well to ask if they need more assistance or some further explanations.

#8. Where applicable, personalize your messages – this will help to build positive relationships with your students, they will feel more committed.

#9. Prevent students from producing spams – inform them, that there is no need to write back ("ok" or "thank you"), if not asked about the confirmation.

3.2 How to write e-mail to teachers?

#1. Be aware of the right tone – treat your teacher with respect, use the proper title as in official letters (e.g. Mr, Mrs., Prof., Dr).

#2. Be as brief as possible, but informative. Clearly address the purpose of why you write at the very beginning.

#3. Remember to give the proper title to your message, so that your teacher will be able to easily identify your issue.

#4. Make sure that you have followed and read all prior comments and messages by your teacher before replying/writing.

#5. Assume that all you write is public – be careful in sharing personal information (both yours and other's), avoid forwarding somebody's e-mails.

#6. Use the proper (formal) language, check grammar and spelling, avoid using emoticons.

#7. Always re-read your correspondence before sending it to the teacher.

#8. Don't forget to sign your message, add other important details that could be relevant to answer your questions (e.g. subject you study, academic program, student's personal number – if applicable and relevant).

Useful e-mail templates while writing to teachers

Introduction	
Subject (specify why you write)	• The name of the course • Consultation *(specify on what)* • Diploma thesis *(provide the title of diploma)* • Question about *(write your question)* • Scheduling a time to meet • Retaking Monday's test
Greeting	• Dear Professor… • Dear Associate Professor… • Dear Doctor … • Dear Mr or Mrs… (in case of non-academic staff)
Main text	
How to start	• I am writing regarding. …. • I am emailing you because … • I would like to kindly ask you …. • I would like to use your consultation offer …. • You can find the file with my diploma thesis in the attachments…
How to end	• Thank you in advance for your feedback on my thesis topic. • I look forward to your reply regarding the structure of my bibliography • I appreciate your advice • Thank you for your time, I really appreciate it!

Ending	
Closing	• Kind regards, ... • Sincerely, • Yours Sincerely,
Identification	First name and surname (or middle names) Students Identification Number (if available and applicable) Study group Name of the course

Here you can find an example of email that was written correctly:

New Message — ↗ ✕

To   Cc Bcc

Subject   **Direct taxes A - consultation**

Dear Associate Professor,

I would like to kindly ask for consultation on the examples of the corporate income tax liability that we calculated this Wednesday in the course Direct Taxes A. I am not sure about the construction of the tax base in Examples 2 and 5.

Can I visit your office during your consultation hours (Monday from 9 to 10:30 a.m.)?

Thank you in advance for your reply.

Kind regards,

Petr Novak

NOV007, EB2UAD01 (personal number, study group)

Here is the overview of examples how not to write emails:

New Message   _ ⤢ ✕

To   Cc Bcc

Subject   --- *(empty item)*

Hello teacher!

I am absolutely confused by the examples. Hope you don't want to include something like this in the exam!

I will come to see you asap …………

Bye, bye :-D

Peta *(without surname, number of student, course, study group)*

Send

New Message

To   Cc Bcc

Subject   --- *(empty item)*

Dear teacher,

I am very sick today, so I am not able to go to school and come to the consultation that we arranged.

Regards …

(Teachers comments: At the same time my colleague met the student on the next floor … please, do not lie, be considerate of teachers, be considerate of other students, who really need the consultation, do not waste their time)

Send

4 Diagnosis

4.1 Uncovering potential areas of concern in digital communication

Both the market practice and research show that gradually, for many years, the role of remote learning in the educational market has been increasing (Wait&Lewis, 2003). In 2022, it is no longer surprising to anyone that university education also takes place in digital environment. Universities apply the online teaching with the involvement of both parties (synchronous lecturers and students), e-learning without synchronous participation of both parties), as well as hybrid solutions that combine synchronous and asynchronous teaching.

COVID-19 pandemic has caused that both lecturers and students had to develop the ability to react quickly to the changes happening around them, and to adapt the tools and methods of education and learning to current (digitalized) conditions. At the same time, for many students participation in remote classes is still difficult, and the barrier of the glass screen does not allow their full engagement and exchange of ideas. Lack of contact with the lecturer and lack of live interaction with colleagues significantly reduces the motivation to actively participate in classes. There is also some evidence that remote learning could encounter psychological issues – a sense of isolation, difficulties in focusing on the screen for a long time, or lack of a sense of support. This could be strengthened by the technical and organizational barriers. In effect, teachers observe the lack of motivation to work in online classes, often accompanied by the higher dropout rates, in comparison to the students who study in non-digital formats (e.g. the evidence by Angelino et al. (2007), who confirmed the attrition rates of 10-20% higher for online classes). This situation often has some repercussions to the universities in the economic sense as well.

In the literature, there is some evidence on the reasons why students are not satisfied with remote and digital teaching. Among the major reasons they list the followings (Hara & Kling, 2001; Moody 2004):

- lack of clear feedback from lecturers,
- incomprehensible, imprecise instructions for assignments,
- lack of technical preparation of learners.

These major concerns have been also reported by the students of the partner Universities. For instance, out of 333 students surveyed in Poland, 170 provided some qualitative comments to the open question on the attractiveness of digital lectures and classes. A relatively high number of students (56) have pointed on the interesting way of the presentation of the content of the course, that offers and enables interaction with students and applies the use of active methods. Moreover, as an equally relevant students

placed the teachers involvement (including their personality), including the quality of their communication skills. Students have reported that the most problematic approach is when the teacher simply "reads the slides", that could signalize the potential barrier of teachers' flexibility to effectively use the possibilities of teaching in digital environment.

As the communication (also in digital teaching) involves both parties, we also have considered the potential difficulties and barriers that are reported by the teachers (lecturers). First of all, an important and frequent barrier of communication is that students turn off their cameras and perform during the lecture many different tasks that are not related to the subject. Lecturers cannot effectively use their body language, gestures or facial expressions, that in the real-world is critical to build relationships and enhance effective communication. At the same time, lecturers feel the pressure of finding a way to reach out the students and encourage them to keep their attention and be actively involved in the tasks.
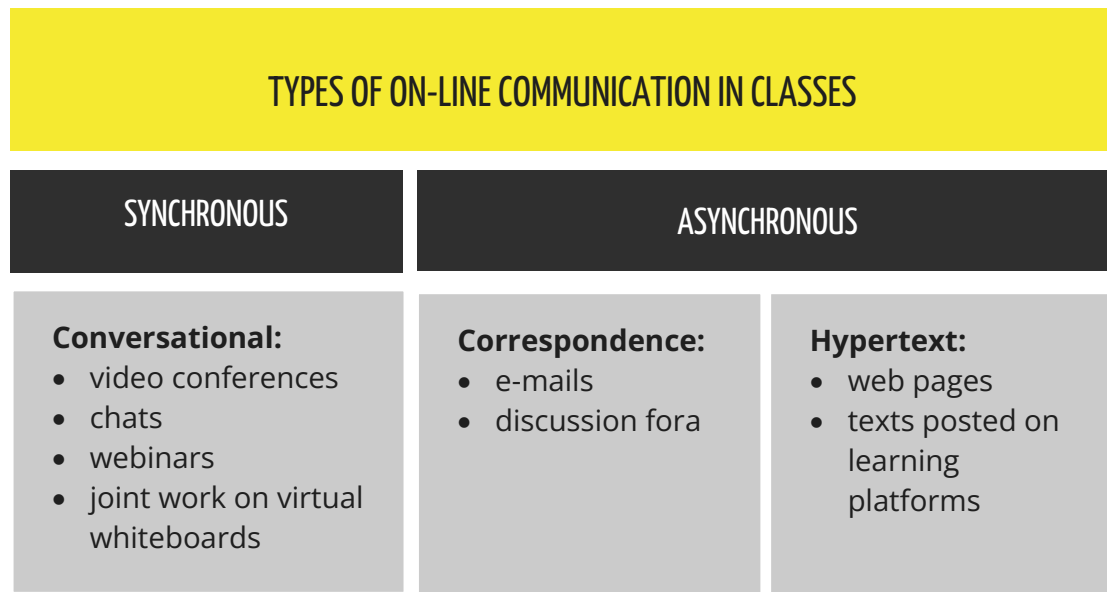
The above was confirmed in our survey, where the teachers (65 for Poland) have complained on the lack of active students' involvement and its disruptive impact on the quality of teaching. At the same time, our respondents remained aware that their commitment is the most important for the effective digital teaching, by active presentations and being creative in enhancing the interaction with students. Some of the respondents have even pointed on the need for innovations that go beyond the active methods of teaching; they are willing to implement the real innovations in teaching that have a potential to involve students. There were also voices on the urgent need of P2P initiatives that could be helpful in sharing good practice and the experiences with the implementation of the solutions of the problems faced in digital education.

Given the findings of the literature and empirical evidence, the proper communication between the teachers and students remains critical for successful learning process in the distance learning environment.

Organisation of digital education

The universities may implement different formats of the organisation of on-line teaching procedures and this remains influential on the selection of appropriate communication techniques and tools. Grzenia (2006) and Wieczbicka (2019) have distinguished between the three types of online communication in the digital education procedures, which is presented in Figure 1.

Figure 1. *Types of communication in digital teaching*

TYPES OF ON-LINE COMMUNICATION IN CLASSES

SYNCHRONOUS	ASYNCHRONOUS	
Conversational: • video conferences • chats • webinars • joint work on virtual whiteboards	**Correspondence:** • e-mails • discussion fora	**Hypertext:** • web pages • texts posted on learning platforms

Each learning situation requires the adaptation of appropriate communication techniques that will enhance the engagement of the audience and enable the achievement of learning objectives. However, the use of appropriate technologies remains an important issue for the efficiency of their implementation.

In the design of methods and forms of communication in on-line teaching, we may also refer to the Kolb's cycle (Kolb, 1984). According to Kolb's, learning is carried out through four stages:

- Stage of experience
- Stage of observation and reflection
- Stage of acquiring knowledge
- Stage of applying knowledge in practice

At the stage of experience, the student experiences a given situation, relives it, or refers to previously shared experiences. The most helpful methods that could be used at this stage are games, simulations, interviews, case studies, use of virtual reality, experiments.
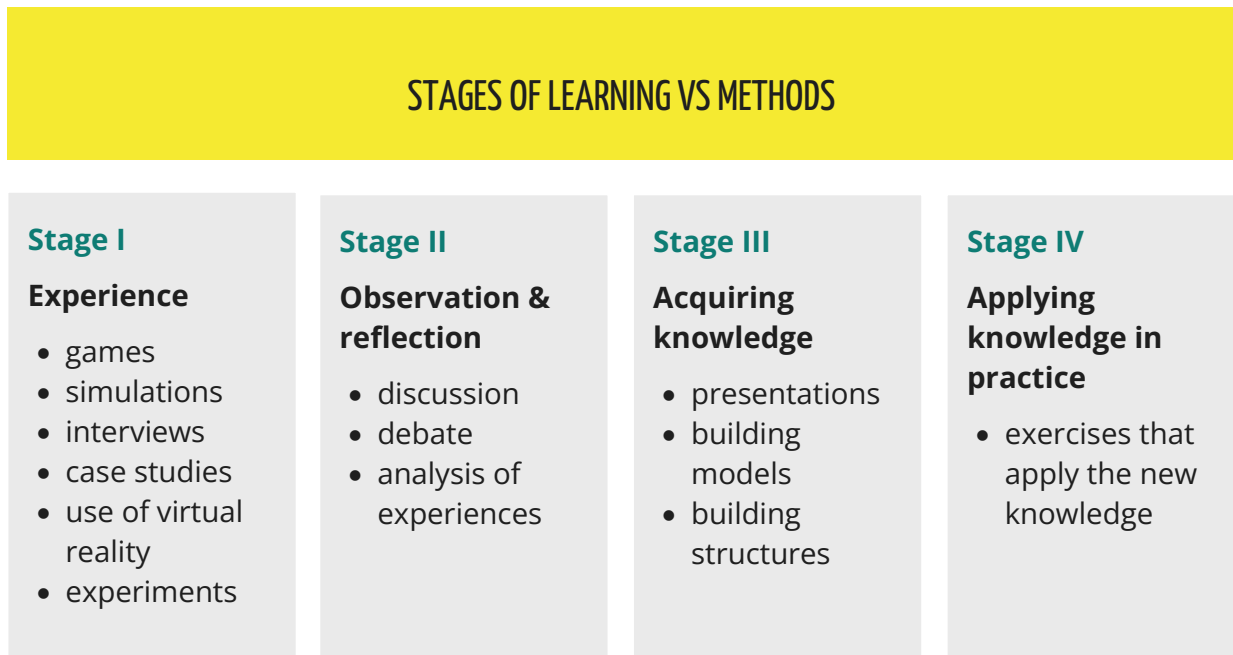
The stage of observation and reflection students analyse the situation they participate in, or others participate in. Methods helpful at this stage: discussion, debate, analysis of experiences.

The stage of acquiring knowledge is for providing the conclusions from the observations and experiences. Students should be encouraged to determine what they have learned through experience and what they are still lacking. This stage is critical for considering some relationships, building the knowledge or providing solutions. Methods that are helpful at this stage are presentations, building models or structures.

The final stage is the stage of applying knowledge in practice. At this stage the student tries to associate the developed solutions to similar situations that may arise in the future, as well as to tests his/her new competence and knowledge in practice. Methods that helpful at this learning stage are any exercises that allow applying newly acquired knowledge.

Figure 2. *Methods recommended for on-line teaching on various stages of learning process*

STAGES OF LEARNING VS METHODS

Stage I	Stage II	Stage III	Stage IV
Experience	**Observation & reflection**	**Acquiring knowledge**	**Applying knowledge in practice**
• games • simulations • interviews • case studies • use of virtual reality • experiments	• discussion • debate • analysis of experiences	• presentations • building models • building structures	• exercises that apply the new knowledge

Techers can use the Kolb's cycle recommendation to plan efficient interventions, to attract and maintain students attention through the whole lecture.

4.2 Case studies: Digital communication channels used at partner Unis

In the DANTE project, we collected the data on the digital communication channels used by partner Universities. The data were collected by the members of project team, by inquiring the responsible university-level units. We collected these data to shed some light on the reasons behind the students' and teachers' satisfaction in digital communication, subject to our survey.

The summary of our findings is presented below, and the details are provided in the appendix. Partner Universities are diversified with the mandatory channels of communication used for streaming the lectures. However, these platforms offer similar functionalities. Interestingly, UE Kat recommends and at the same time mandates their students and teachers to use one environment both for streaming the lectures, and for posting the materials. VSB-TUO, TUKE and IP Santarem adopted a different strategy, by sticking more to the functionalities of Moodle platform, for posting educational materials and examination procedures. MsTeams or Zoom are used only for streaming purposes.

Figure 3. The channels of digital communication used on partner Universities

Communication	UEKat	VSB-TUO	TUKE	IP Santarem
platform used for communication	GoogleWorkspace – GoogleMeet (mandatory)	MsTeams	MsTeams or Webex	Zoom (mandatory)
platform used to post materials	GoogleWorkspace-GoogleClassroom (mandatory) Moodle or other platforms – as supportive	Moodle	Moodle	Moodle (mandatory)

In each of the partner Universities pandemic has resulted in some organizational efforts targeted at unifying the procedures of direct digital communication in teaching (streaming of the lectures), as well as organizing the availability of the materials. Each partner University has also declared that the leading platform of communication remain the e-mail contacts and the University websites, supported by the issuance of newsletters. We also noted that partner Universities tend to implement the integrations of the system used for communication, so that their functionalities are increased and more compatible.
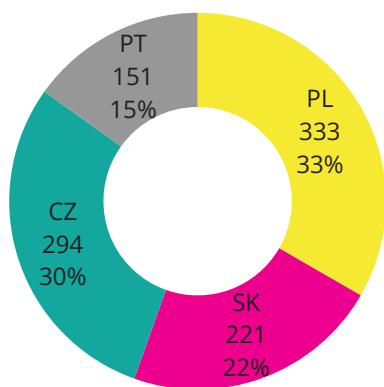
4.3 Survey – students' and teachers' opinions on their satisfaction from digital communication

To support the development of DANTE guidelines on synchronous and asynchronous digital communication in teaching, we have run a survey, to gather the students' and teachers' opinions on their satisfaction from digital communication, including the channels of communication used. The results of the survey are briefly reported below.

Survey invitation was forwarded only to the students of third year of bachelor education or second year of master education, to ensure that this target group has experienced both pre-pandemic education, as well as the pains of the first lock down and the related requirement of distance learning implementation. The survey was conducted in November 2021.

Number of the respondents by countries (partner Universities)

Panel A. Students (N=999)   Panel B. Teachers (N=245)
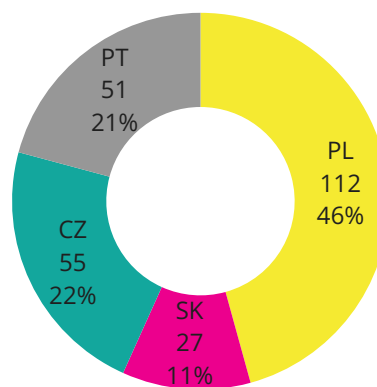
Notes: PL – Poland (UEKat); SK – Slovakia (TUKE); CZ – Czech Republic (VSB-TUO); PT – Portugal (IP Santarem)
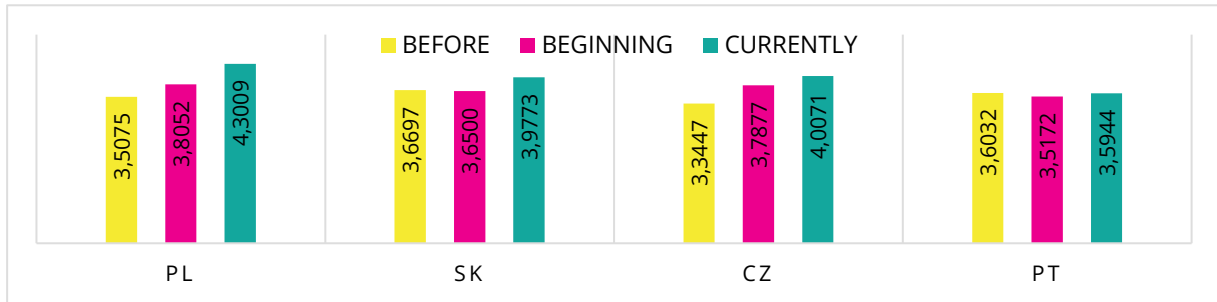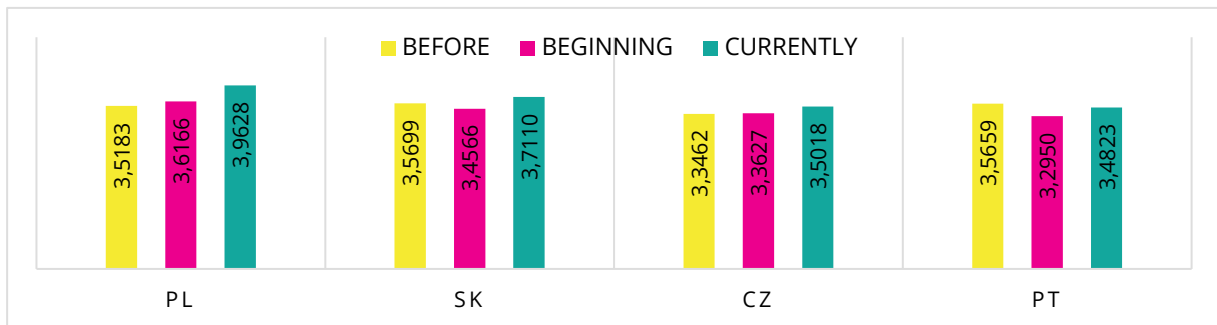
Digital communication skills

The first problem we addressed in our survey was the evaluation of digital communication skills. We asked students to evaluate teachers, and the teachers – to evaluate the students. All respondents have been asked to evaluate their satisfaction on the quality of digital communication skills for the situation before and at the beginning of the pandemic, as well as currently (after pandemic). These evaluations were provided on 5-point Likert scale.

The survey at partner Universities has confirmed that students' satisfaction from digital synchronous communication with teachers has increased after the pandemic (except from Portugal). For asynchronous communication, the situation has not changed significantly, if we compare pre and post pandemic periods. Similar conclusions could be drawn from the responses of the teachers. The satisfaction rate from direct communication with students at the beginning of pandemic has declined, but after the pandemic it is comparable to pre-pandemic period. The mean rates for indirect communication remain similar in the compared periods.
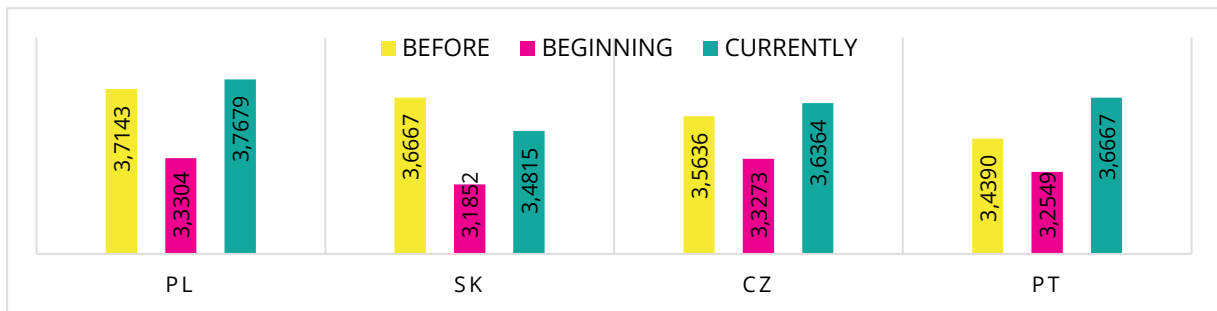
STUDENTS: Are you satisfied with the quality of direct digital communication with teachers? (on-line lectures, individual calls) – mean values
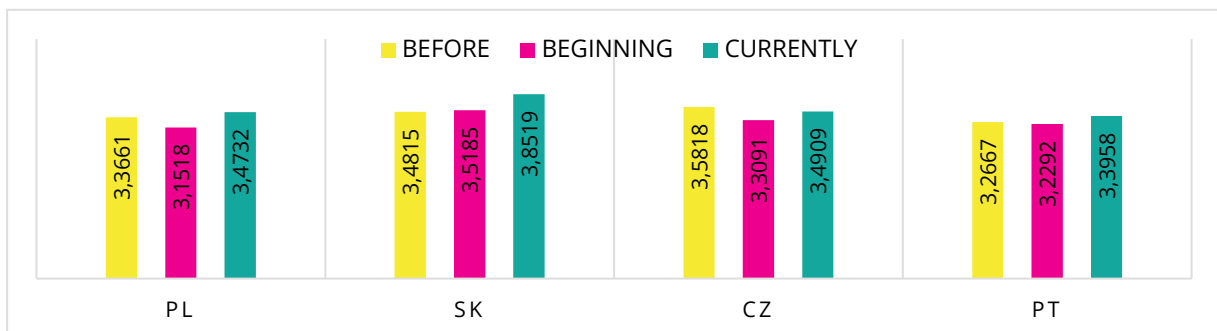
BEFORE   BEGINNING   CURRENTLY

	PL	SK	CZ	PT
BEFORE	3,5075	3,6697	3,3447	3,6032
BEGINNING	3,8052	3,6500	3,7877	3,5172
CURRENTLY	4,3009	3,9773	4,0071	3,5944

STUDENTS: Are you satisfied with the quality of asynchronous digital communication with teachers? (homework, discussion fora) – mean values

BEFORE   BEGINNING   CURRENTLY

	PL	SK	CZ	PT
BEFORE	3,5183	3,5699	3,3462	3,5659
BEGINNING	3,6166	3,4566	3,3627	3,2950
CURRENTLY	3,9628	3,7110	3,5018	3,4823

TEACHERS: Are you satisfied with the quality of direct digital communication with students? – mean values

BEFORE   BEGINNING   CURRENTLY

	PL	SK	CZ	PT
BEFORE	3,7143	3,6667	3,5636	3,4390
BEGINNING	3,3304	3,1852	3,3273	3,2549
CURRENTLY	3,7679	3,4815	3,6364	3,6667

TEACHERS: Are you satisfied with the quality of indirect digital communication with students? – mean values

BEFORE   BEGINNING   CURRENTLY

|	PL	SK	CZ	PT
BEFORE	3,3661	3,4815	3,5818	3,2667
BEGINNING	3,1518	3,5185	3,3091	3,2292
CURRENTLY	3,4732	3,8519	3,4909	3,3958

Digital communication channels

The second problem we addressed in our survey was the satisfaction of the digital communication channels used. We asked students and teachers to provide their rates at 5-point Likert scale. We were interested of their satisfaction from the digital communication channels at the beginning of pandemic, and then – currently (post pandemic).

Overall, we observed that in the post-pandemic situation the satisfaction of both teachers and the students from the platforms used for digital communication is higher (except from Portugal). It suggests that students and teachers has accustomed to the use the digital communication channels more efficiently, thus the satisfaction of both parties in digital communication has improved.

The exception is Porgutal (IP Santarem), with no change. We hypothesize that this could be driven by the specifics of the universities profile. UE Kat (Poland) is relatively homogenous in teaching, specializes in economics, finance and management. VSB-TUO and TUKE are similar, given the variety of the university faculties (including economics). IP Santarem seems different with is technical orientation and this could be influential on the easiness of the implementation of digital communication and the related channels in teaching, thus remaining influential on students' satisfaction. Thus, IP Santerem students and teachers are equally satisfied with digital communication channels given pandemic and post-pandemic state.

STUDENTS How much satisfied you are with the software platforms used for on-line lectures? – students, mean values
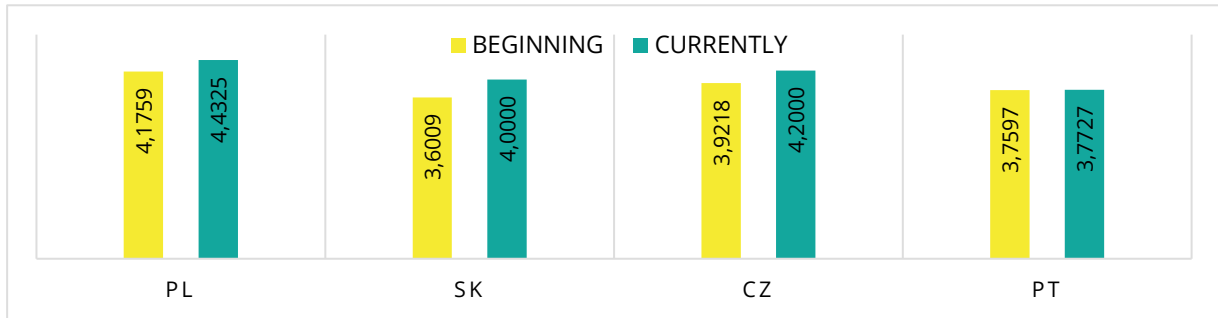
TEACHERS How much satisfied you are with the software platforms used for on-line lectures? – teachers, mean values
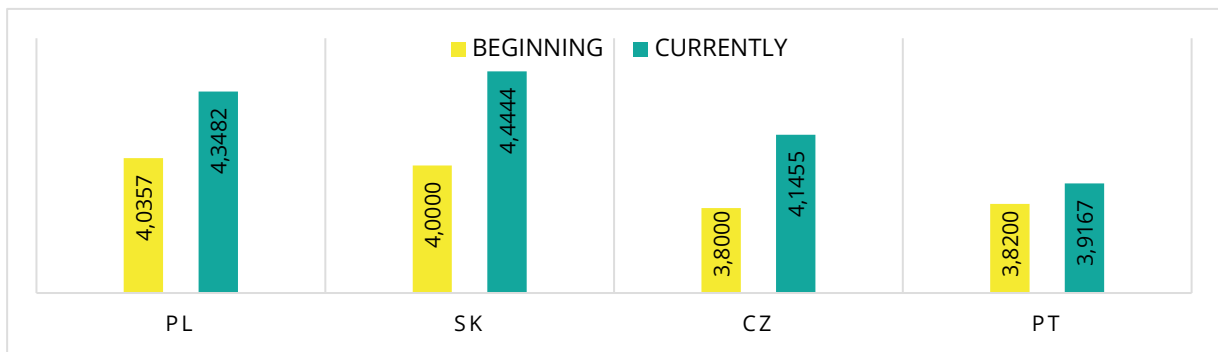
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