

# Digital Culture for the 21st Century Vocational Education



BIOTEHNIŠKI  
IZOBRAŽEVALNI  
CENTER LJUBLJANA

Co-funded by the  
Erasmus+ Programme  
of the European Union



2020-1-HU01-KA202-078760

# Learning for the development of the digital culture

BIC Ljubljana, Slovenia

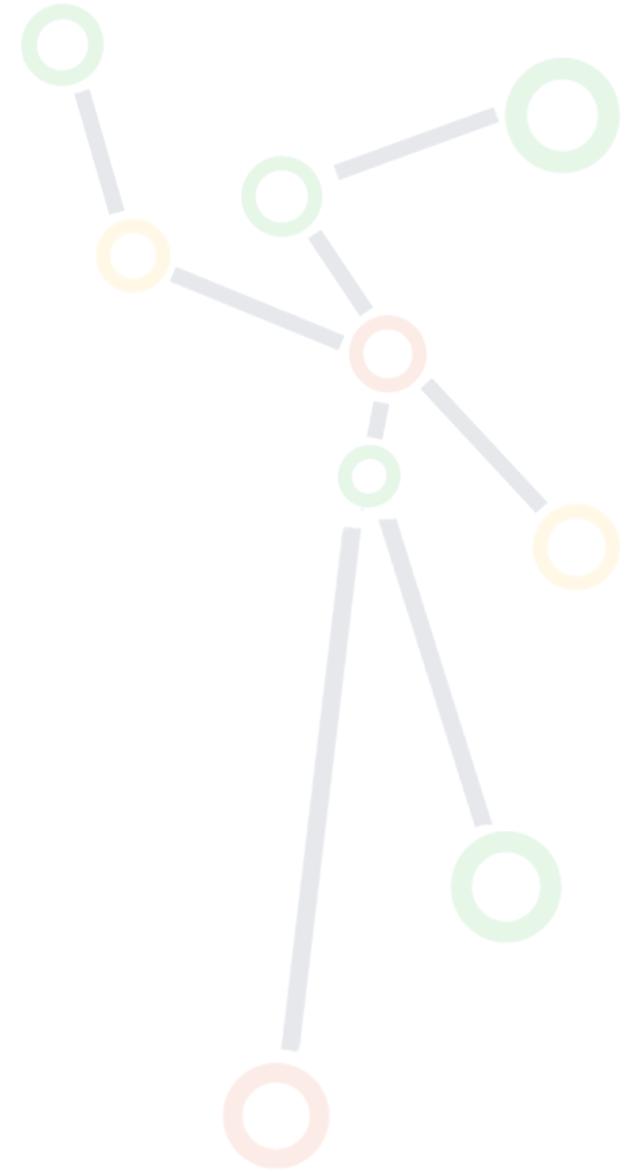
April 18, 2023



Pozdravljeni, dober dan

Szia, jó napot

Hello



# About BIC Ljubljana - history

- Certain major historical landmarks proved significant for our school in the past. **The Bleiweis horseshoe** school, the predecessor of our school, was established in 1848 as one of the first Slovene schools in the Austro-Hungarian Empire.
- **The Secondary School of Veterinary Science** was founded in 1947 when New Yugoslavia was formed.
- In 1991, when Slovenia gained its independence, we moved to a new school, located in Mestni Log in Ljubljana - **Secondary School of Agriculture and Food Technology**.
- In 2005 (a year after Slovenia had become a member of the European Union) **Biotechnical Educational Centre Ljubljana** was founded with four schools under its roof.

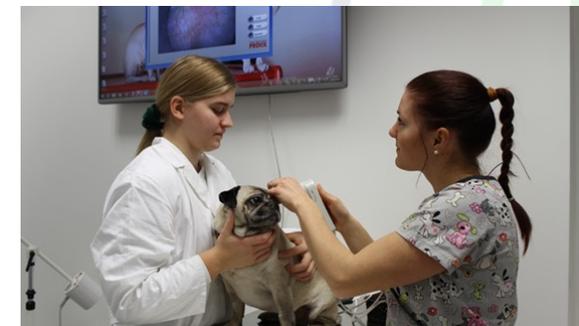
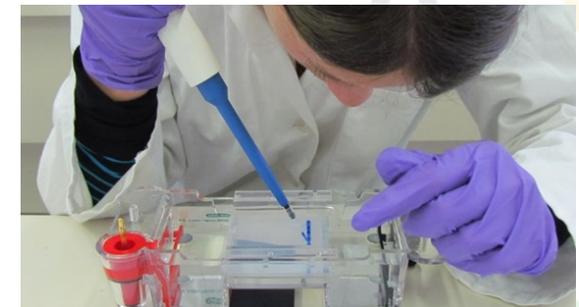
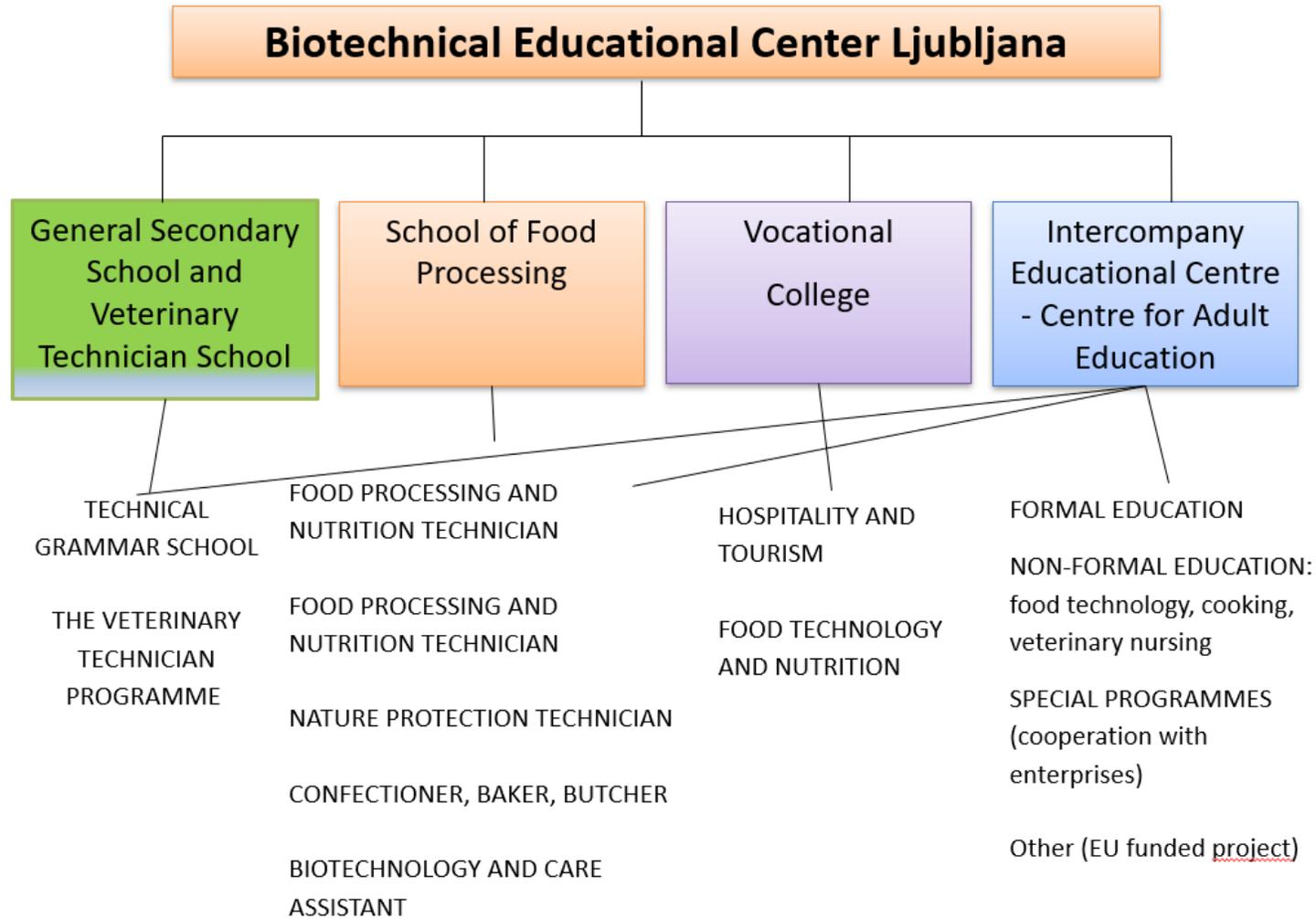


# BIC Ljubljana today

- Today is Biotechnical Educational Centre Ljubljana, one of the ten biggest educational centres in Slovenia, is a **public institution** offering education and research in the field of **secondary, short-term tertiary and adult education** related to biotechnical area (veterinary, food technology, nutrition, environment, biotechnology etc.), hospitality and tourism.
- BIC Ljubljana has been awarded by the European Commission for **the most innovative school in the field of vocational and professional education in the EU for 2020** (the first recipient among schools in Slovenia)



# BIC Ljubljana – SCHOOL CENTRE

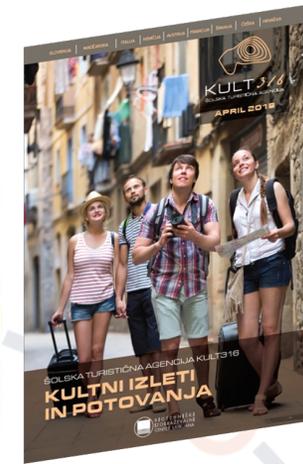


# BIC Ljubljana - MOORE THAN SCHOOL

- In 2015, we opened the **first school veterinary clinic in Slovenia**.
- In October 2015, BIC Ljubljana also opened the **Culinary and Tourism Centre KULT316**, which represents a unique and representative example of modern educational practice in hospitality, tourism, food technology and nutrition.
- The Culinary and Tourism Centre KULT316 boasts a **demonstration kitchen, a learning kitchen, a learning hotel room, a conference room, a wine cellar, an information point, a restaurant and a café**.



- The first **school tourist agency** has been operating on our premises since 2017.
- In 2020, we opened **EcoHouse BIC Ljubljana**, a wooden and almost zero energy school building for students in the nature conservation technician programme.



- The center's shop **KRUHarije in CUKRnije** offers confectionery and bakery products made in the centre's own bakery.

- Since 2014, the Biotechnological Educational Centre Ljubljana has been running the **Primula teashop** located in the botanical garden.

- Student and Staff Mobility (Since 2002) - Erasmus+



Students in Spain



Students from Finland





at



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# Working group

- 13 active members are involved in the Wetwork project at BIC Ljubljana.
- Teachers comes from different backgrounds – they teach mathematics, physics, economics in tourism, professional Italian and German, food processing, psychology, biotechnology, food processing and nutrition, lecturer at the vocational colleague.
- Among teachers, two librarians actively participated as well, which brings additional value and another point of view to the project.

# Starting point

## At the projects start:

- Interviews conducted (with students, with teachers in general, with teachers who are more computer literate)
- SELFIE questionnaire distributed to get an insight to which extent we use digital tools in our school. Teachers have self-evaluated their skills and use of ICT (and will continue to do so after the project is over)

## Specific findings from our school are as follows:

- **remote working** has had a big impact the way teachers work (i.e. the whole school has learned to work with MSTeams)
- **teachers already have been using these digital tools** (prior the project start): eAssistant, Moodle classrooms, MSTeams, Arnes identities, and are Outlook proficient.
- Among the students (GVS) we gathered class representatives last year (2021-22) who communicated with the main project contact when they recognize an issue or a concern in the class that they wanted to resolve (IT topics). We were able to establish trust that students and teachers approach our main contact persons for the project if they need any help.
- The main project contact also took on the role of IT coordinator. Last year (2022) it became an official position in the school. Previously only a computer scientist could hold this position, now also teachers who have excelled in this field in the past 2 years are being trained as IT coordinators;

**Based on the findings, we drew up an internal Digital Pedagogy Strategy, which will be revised and adopted after the project ends** (if and as needed).



## Biotechnical Educational Centre Ljubljana

### Digital Pedagogy Strategy 2025

We developed our strategy in line with the main objectives of the school, taking into account the results of the SELFIE institutional self-assessment, given interview by teachers, students and head teachers.

#### Vision

In our school, educators, equipped with modern, student-centred pedagogical methods, use a wide range of digital tools to prepare our students for successful participation in the labour market, both professionally and also in terms of key competencies.

We wish to unify and standardize implementation of a few basic digital tools for educational purposes. There should be one clear system for communicating with students. Furthermore, we will support the teachers in using a variety of different methods and digital tools for pedagogical purposes of their own choosing.

#### Strategic goals

- Providing high quality, student-centered education.
- Developing students' digital skills in line with labor market needs.
- Continuous training and development of our teachers.
- Unification and standardized implementation of 2-4 basic digital tools for educational purposes (eAssistant, Google Workspace, Microsoft Teams, Moodle).
- Further ICT/digital education on online tools should be individualized as much as possible for teachers as well as for the students because of their different levels of pre-knowledge, different needs (e.g. one teacher might need totally different demonstrations and explanations on online tools than some other teacher because of different set of pre-skills and needs).
- ARNES internet student identities should be kept in the following year as well.
- Technical administrator's mail support should be kept active (always accessible to all students who have technical issues that they cannot resolve by themselves).

#### Innovative aspects

- We introduce ICT representatives in each class (students responsible for communicating all



# Getting to know the subject (DMC, ICT)

Teachers attended 3-week training course and each week teachers explored:

- individually new chapters from the DMC portal
- evaluated usability of introduced methods, digital tools
- exchanged best practices on how to use digital tools for pedagogical processes.
- *Best practices: training was used to **develop digital pedagogical strategy** and action plan related to it.*

Working group than attended 15 workshops:

- with an expert **we looked at the digital tool together**
- then the participants were given homework
- *Best practices: they were encouraged to try out the digital tool on their own and discuss it further on the next session – **peer to peer learning opportunities.***
- Some workshop were a **demonstration of a teaching** method instead of a digital tool.
- *Best practices: In that case then the trainer presented the method and materials, how he/she uses the method with students. Teachers then discussed if they had already tried it themselves and how, how they could use it in their own subject – **peer to peer learning opportunities.***



## Peer Learning

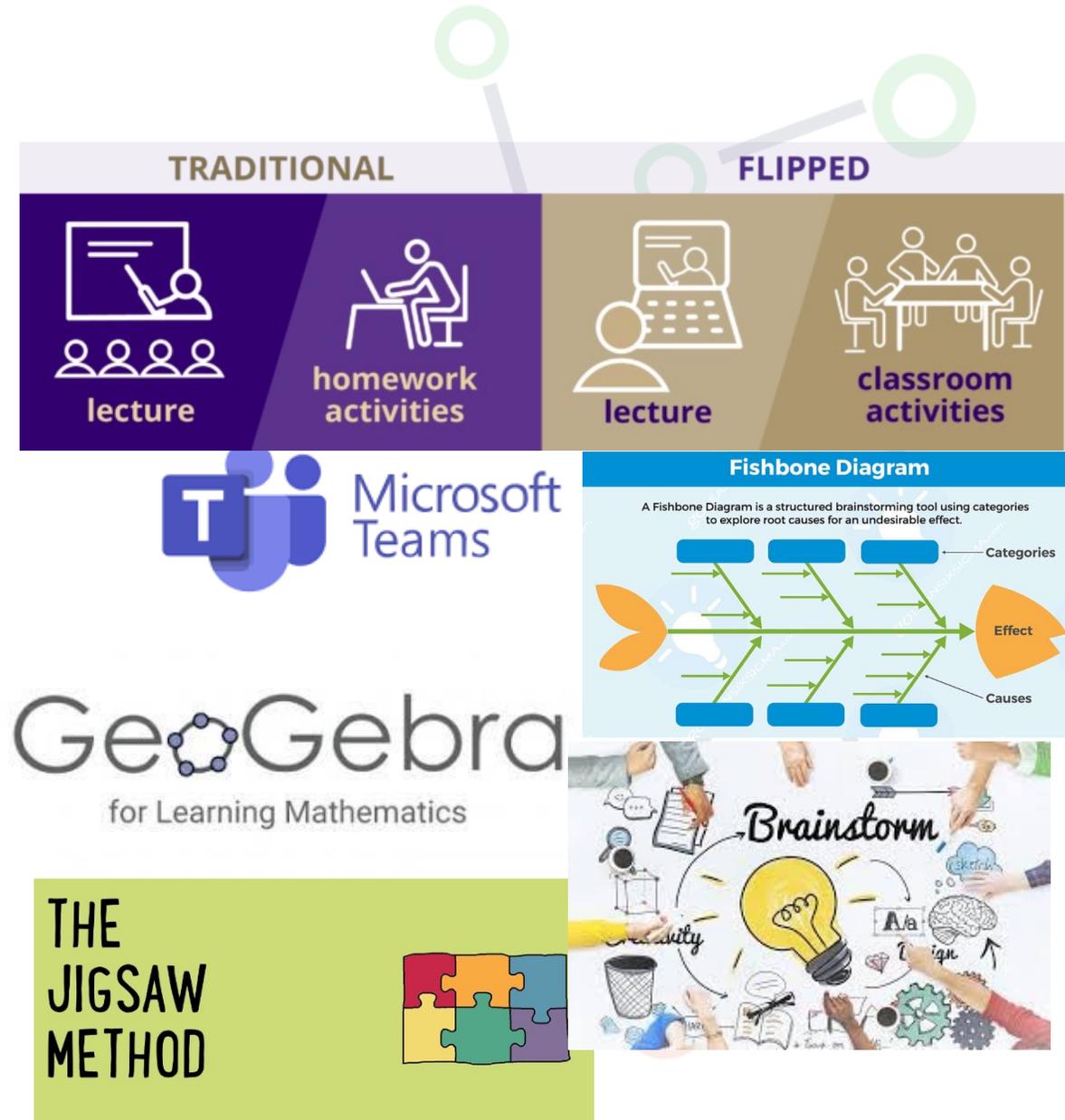
# Learning, learning

- Subjects of the workshops: MS teams, Flipped Classroom Method, Jigsaw method, MS Whiteboard, Exam.net, Fishbone Diagram, Innovating / Design Thinking, Math online – Photomath & GeoGebra, Brainstorming, Kahoot, BandiCam, review of useful apps (i.e. QR code reader,...)

→ *Example: at the workshops, the lecturer showed several applications that teachers are already familiar with, but pointed out additional features, e.g. special settings in ZOOM so that your avatar is also displayed in the background while you are explaining, not just in a window as usual.*

- Two of the Wetwork members are maths teachers, and one of the lecturer also teaches maths at the university, so we have had a few more workshops on this topic.

→ *Best practice effect: At the end of the project we saw that math teachers exchange the materials and lesson plans more often than before.*



# Knowledge put in action

- During the course of project **17 teaching plans** for specific lecture were created and are **available on the DMC website**.
- Out of these 17 teaching plans, **10 were later on piloted in the classroom**.
- Teachers also explored and learnt **if the method they have chosen is appropriate for a certain lesson, certain subject**

→ *example: Kahoot for match class is good for reinforcing the knowledge, and less appropriate to learn completely new subject.*

- The students found such approaches interesting (i.e. Kahoot, flipped classroom method.)

→ *feedback: in such cases, they expressed their wish to have more lessons using such digital tools and associated methodology. They are in general in favour of this type of lesson (using various digital tools).*

## CLASSES PILOTED

TEACHER	DATE	CLASS	NUMBER OF STUDENTS	TOPIC
Teacher 1	29. 11. 2022	14. grade	10	Sensory analysis of food
Teacher 2	6. 12. 2022	10. grade	16	Work and energy
Teacher 3	25. 11. 2022	11. grade	12	Food ordering and composing a menu in Italian language
Teacher 4	3. 11. 2022	14. grade	40	Valorisation of the Tourism Offer
Teacher 5	8. 11. 2022	10. – 12. grade	27	finance and interest rate
Teacher 6	23. 11. 2022	12. grade	21	Classification and properties of substances
Teacher 7	27. 11. 2022	12. grade	30	transport through the membrane
Teacher 8		11. grade	25	Determining milk density
Teacher 9	24. 11. 2022	12. grade	21	Behavior of a polynomial graph around its zeros
Teacher 10	28. 11. 2022	11. grade	24	Sensation and perception

# Digital tools & teaching methods

- A **variety of digital tools** was chosen by teachers. Most often **Moodle** was used, followed by **h5p** and **Kahoot, MS Teams, Mentimeter** and others.
  - Applications to recorded screen were used as well, i.e. **PowerPoint 2016+ as screen recorder**
- *Best practices example: in class Economics in tourism students got a task to choose their dream tourist destination and separate primary and secondary tourism offers, and prepare 1 minute video on the subject.*
- The project encouraged teachers to add something extra to their lessons to do it more often.
  - **When the students use digital tools at one subject, it is usually easier for them to use digital tools at others as well.**
  - In the class teachers used **various teaching methods, flipped classroom** was used most often, than also **Gamification, quizzes**, and traditional teaching method like **Explanation** as well.
  - **Online test-taking** as an assessment option, was chosen most often to give students the possibility to **practice, learn and firm the knowledge every time they take a quiz.**

## METHODS AND TOOLS USED IN CLASS

TEACHER	TEACHING-LEARNING METHOD	DIGITAL TOOL APPLIED	EVALUATION METHOD
Teacher 1	Gamification	Kahoot	Double Evaluation - digital quiz (Google forms) and paper-pencil quiz
Teacher 2	Inquiry-Based and Research-Based Learning	Canva, YouTube, Gizmos, Moodle, H5P, Plickers	Diagnostic assessment (Plickers)
Teacher 3	Explanation	Moodle, H5P	Digital quiz (open for repeating)
Teacher 4	Multilateral communication, dialogue method, explanation	Moodle, PowerPoint 2016+ (screen recorder)	Evaluation of practical work
Teacher 5	Flipped classroom	Google Forms, video-animations, YouTube, MsTeams	Discussion, success on Google Forms, student's evaluation by questionnaire, self-reflection.
Teacher 6	Flipped classroom	MsTeams, H5P	Oral questioning
Teacher 7	Demonstration, Problem-based learning	Video	Evaluation of practical work
Teacher 8	Gamification, Brainstorming	Google Forms, YouTube, MsTeams	Quiz, self-reflection
Teacher 9	Demonstration	GeoGebra	Written assessment (homework)
Teacher 10	Flipped classroom	Online repository for Physics	Peer evaluation, Written assessment (homework)

# Organizational multiplication effects

- Teachers who were not involved in the project have been invited to attend the workshops as well.

- In informal discussion peer to peer, on school events, conferences teachers shared with colleagues their best practices, knowledge, and novelties they have learnt.

→ We can estimate the 50% of all teachers in our school have heard of project, and around 30% may have used it in one way or another - applying new methods, trying new approach, using digital tool they have heard of from their colleagues who were involved in the project.

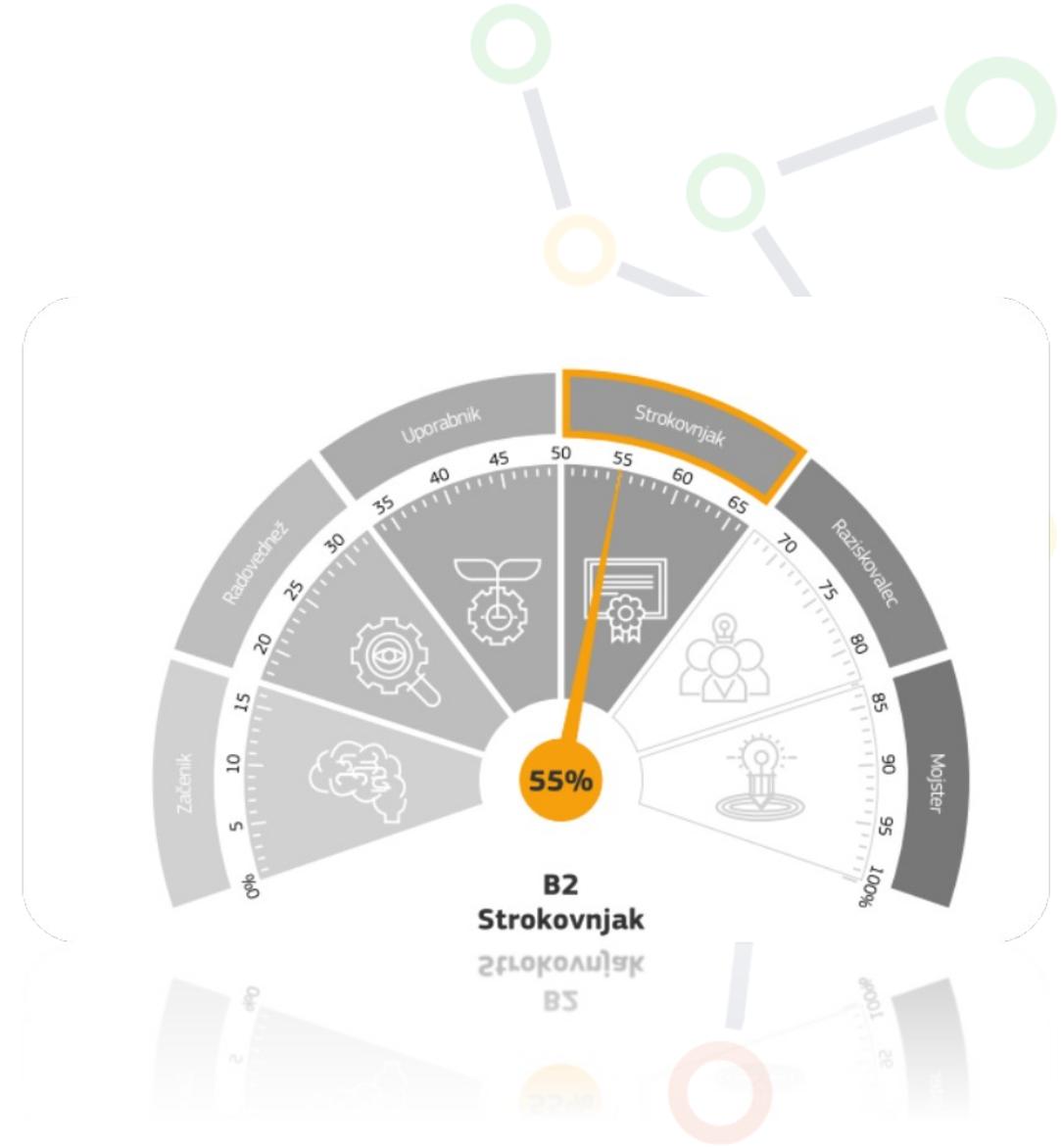
- Teachers reported they already had talks to their counterparts in other schools and mentioned the project to them, DMC homepage and its repository.

→ We can estimate that from schools and organization we usually cooperate, some individual schools as well as their teachers could join or at least use the methodology or new digital tools as they have heard about it either formally or informally.



# DigCompEdu 2023

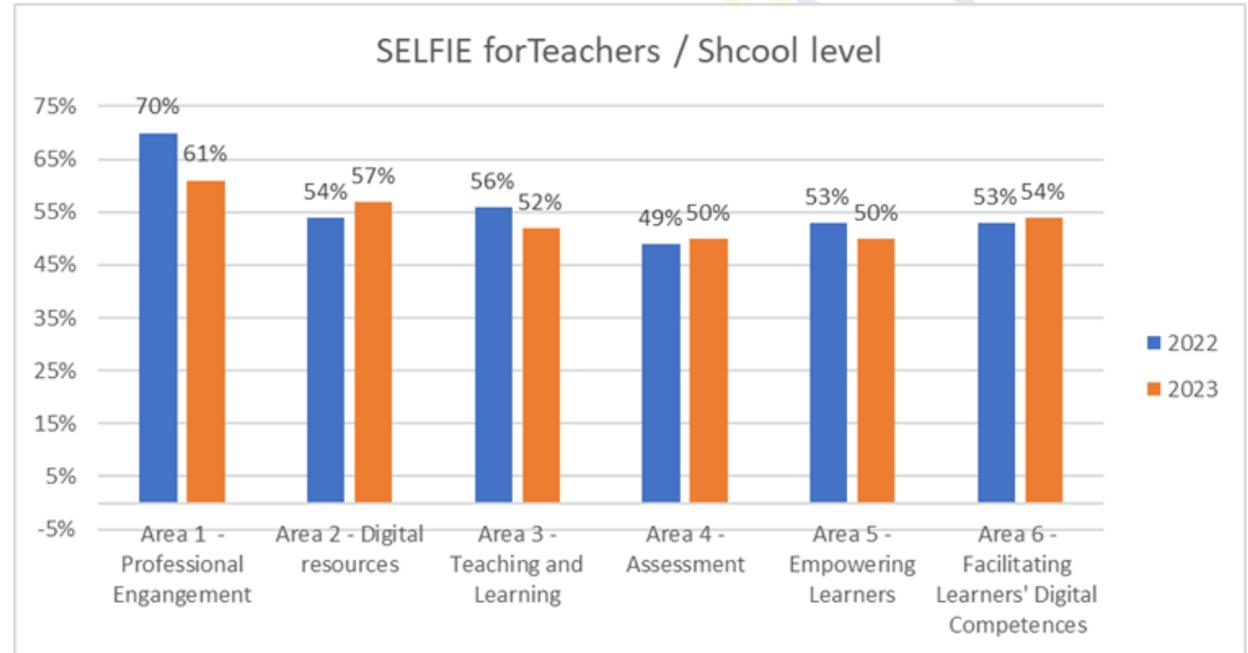
- Teachers who actively participated in the project entered it with different levels of knowledge on the digital tool's features and competence level.
- They are spread across all competence levels, except for the A1 – Newcomer [there we have none], with majority on level B2 – Expert, followed by couple on level A2 – Explorer, and the rest on the remaining levels [B1 – Integrator, C1 – Leader, and C2 – Pioneer].
- On a school level 2023 competence level is B2 – Expert [same level as 2022]



# DigCompEdu 2022 - 2023

- Looking at the individual areas, the results are comparable between the two periods and does not deviate considerably, with the exception of the Area 1 – Professional engagement.

→ In the 2022 self-evaluation survey a cumulative result on a school level for Area 1 was C1 – Leader level, in 2023 self-evaluation survey resulted in B2 – Expert level.



\*\*The 2023 survey was further developed and contained more questions in each of the areas, hence the data are not fully comparable and cannot completely satisfy statistical relevance.

# Summary...

- Since the beginning for the project **teacher's professional development has improved both**, on individual and on a school level.
- As learning can take place in formal or informal settings, teachers **have gained new knowledge** by attending the workshops where they **learned about new and innovative approaches, teaching techniques** and digital tools that can be used **to boost learning and motivation among the students.**
- **Teachers with different level of competencies participating** at the same workshops and having to prepare lesson plans in the same way **elevated peer to peer learning initiatives.**
- Teachers report about learning new methods and digital tools **as well as the intent on using them later on.**
- They find the **DMC website a useful repository** and have told about it to teachers outside of our school.
- Based on a feedback from teachers and students the improvement in school's digital culture is tangible. They **see the project as a means that pushed them to go outside of their comfort zone and use ICT they did not feel qualified to use yet.**
- The teachers in our school already knew of a few digital materials and teaching methods, they already use some, but the **project helped them to gain new knowledge and broaden their horizons, share experiences and also learn about themselves.**

# ...and conclusions

- Some teachers had wanted to create digital materials prior the project, and then covid period gave them the impetus they needed to get started. Therefore, **participating in Vetwork project was timely and beneficial** and some digital tools and methods teachers still use as part of their lessons today, also for the assessment.
- Our school is generally encouraging teachers to be creative in teaching, we believe this project gave satisfactory results.
- We had some non-pedagogical staff in the project. Our librarians also learned about new teaching methods and digital applications.
- The long-term effect of the project is certainly the upgrading of their existing knowledge. The platform is useful and stimulating because it combines different teaching approaches and encourages us to be innovative.
- One of the librarians commented that the project was a great contribution to their professional development, since they are still at the beginning of their work as a teacher.

# A reflection for the end

Teachers at our school tell of satisfaction in learning about different evaluation methods and self-reflection. New methods take a lot of time to implement, but they do bring some extra entertainment into the classroom.

However, digital tools should be used as and when needed and not to forget about the traditional teaching and note-taking, which is still an important learning process.

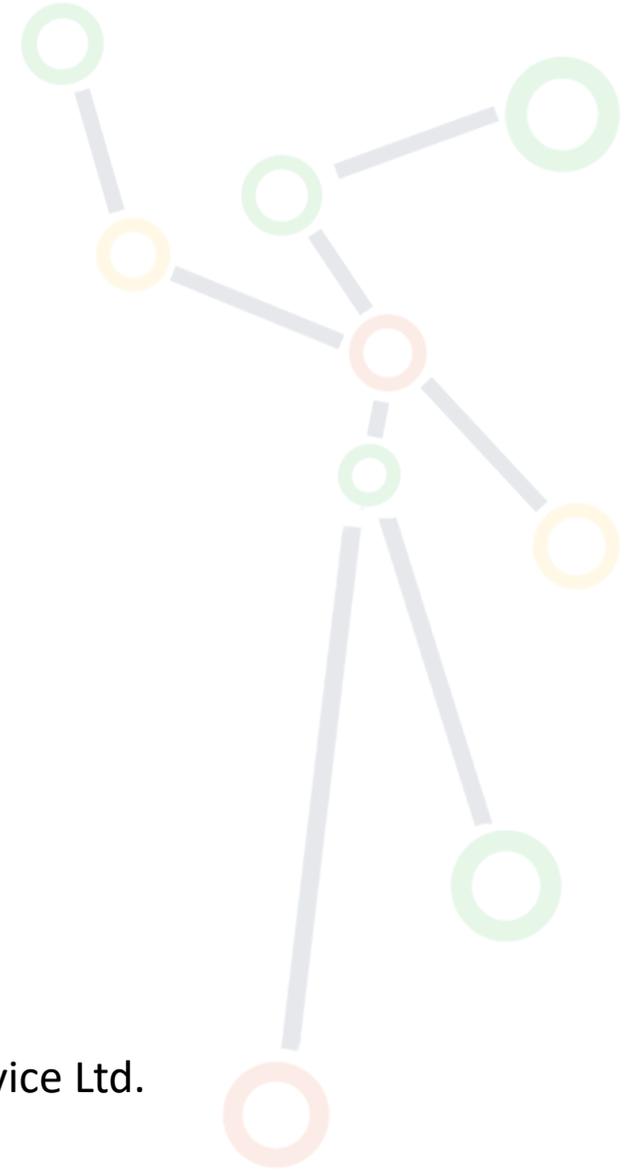


"Teaching children  
is an  
accomplishment  
...getting children  
excited about  
learning is an  
achievement."

--Robert John Meehan

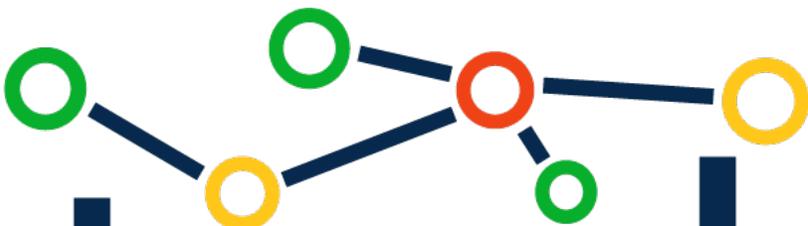
# Project basics

<b>Title</b>	Digital Culture for the 21st Century Vocational Education
<b>Acronym</b>	VETWork
<b>Project ID</b>	2020-1-HU01-KA202-078760
<b>Program</b>	Erasmus + KA2, Strategic partnership
<b>Target group</b>	VET teachers, trainers, managers
<b>Beneficiaries</b>	VET students
<b>Partner countries</b>	Hungary, Slovakia, Slovenia, Romania
<b>Duration</b>	1st Sep 2020 - 31st May 2023
<b>Contact</b>	PROMPT-H Information Technology Educational, Trade and Service Ltd.



**Thank you for your attention!**

**Vetnetwork**



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# Appendix: Reflection / feedback from the teacher

- Rok Demič, a short self-introduction: I am a teacher of Microbiology and Laboratory Exercises, teaching 3rd and 4th year students . I am at my 4th year teaching here, previously I taught for 4 years at a vocational secondary school.
- School: Gymnasium and Veterinary School, Biotechnical Education Centre Ljubljana
- Lesson title: Transport of substances through the cell membrane, all forms of endocytosis
- I wanted to create digital materials before, and with the corona I got the necessary impetus to make it happen. I made simple animations for the more complex parts of the material and created the graphics and animation by myself, recording with a screen recorder. I relied a lot on Google Forms, which is still part of my lessons today, even for the assessment. Now, when I want to distance students a bit from screens in class, we use the Plickers app instead of Google Forms.

# Methods

- Teaching/learning method used: Flipped classroom, students pick up information from scripts and videos, work in pairs, reinforce with Google Forms and presentations
- Assessment method used: Google Forms Digital learning content
- Type: Word document with instructions and all links-videos and Google Forms.
- Sharing: Students were given the instructions on a class email (just at this time they were having problems accessing the MST) and by the MST team.

# Evaluation of the pilot lesson I.

## Did the chosen active learning method prove to be successful?

- Judging by their responses in the survey, **students were more in favour of this type of lesson** (80% indicated that they would prefer this type of lesson, 20% indicated that they did not care, no one indicated that they would not have this type of lesson anymore) than the traditional one.
- From the past experiences, I conclude that **students have gone into the details of the material**, but they have **no idea how this relates to the rest of the knowledge**.
- So I dare say that the **specific learning objectives have been met**, i.e. they understand and can explain how the Na<sup>+</sup>-K<sup>+</sup> pump works, **but I doubt that they have any idea what it means for a membrane or a cell**.
- The students should have completed the task when we had an "assignment" on the timetable but only 3 students in the class (out of 30 students) did so. The others then did the lesson in the next regular lesson in school. The lesson was set up in such a way that they were supposed to do one part on their own and at least some in pairs. Watching videos in class and then talking in pairs would have made too much noise in the classroom, so I allowed them to find a place around the school.
- How much was really independent work and how much was group work is hard to say. When group students are involved in the same activity, there is expected a „postponing and waiting“ when one part of the group is waiting for another part of the team to complete the task. It is also quite possible that a student could do everything on his/her own, without the collaboration of his/her classmates. This means that it is possible that some students were extremely active, while others were practically nothing at all-except for clicking/typing answers on Google Forms.
- The answers to the survey overwhelmingly claim that students were more active than otherwise or that they learned more.

# Evaluation of the pilot lesson II.

- The students have generally taken well to the different lesson plan, the less supervision is probably a good thing for them, but they are young, skilful, intelligent and enthusiastic people who are not afraid of change and new things.
- The work itself was nothing really new for students - they know YouTube, 3D animations, the topic was in line with the material we had in class, they know Google forms, and they are no strangers to working in pairs.
- As far as the teacher's workload is concerned, I wouldn't say that the preparation is more extensive than it would otherwise be. The lesson is pretty much set up in such a way that the teacher doesn't need to be actively involved during the lesson, but it does take some time to gather resources, write up the instructions and check at the end if and how they have solved the quizzes.
- In case teacher has the same lesson in several parallel classes (A, B and C), he has even less work than in regular lessons where he has to actively work/explain, check, etc. Even though the lesson is set up in such a way that the teacher does not need to be involved much, students need some „supervision / push" to get the work done. Most of the time the students have only done the work at school.
- At the end of this lesson or at the beginning of the next one, it makes sense to do a joint reinforcement exercise, where the newly acquired knowledge is linked to what is already known.