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Project "Learn it Today to Manage it Tomorrow" (01.09.2018-28.02.2021)

Digital Handbook

of articles from project participants

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Content

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FOREWORD

It has become an ordinary saying that in contemporary school teachers can't teach using 18th century methods. Of course, the past has shown us the path to the future and given possibilities to develop not only new approaches for teaching but also new technologies. The world we are living in is changing rapidly, revealing new demands and expectations especially to people just entering job market. For this reason, we created the project "Learn in Today to Manage it Tomorrow".

The title of the project reflects its content: teachers within the project create digital study materials that support the development of five key-competencies such as intercultural competence, program-based thinking, virtual cooperation, transdisciplinarity and design-thinking. These materials are tested with students and according to the students' feedback changes are made into materials.

In the academic year 2019/2020 schools faced another challenge – the spread of a deadly virus throughout the world put the whole world on hold. In this period teachers felt the real need for those materials in order to develop through them the above-mentioned competencies in students. Ability to work effectively in teams in virtual environment, ability to transfer data into smaller concepts and build algorithms, ability to transfer and use knowledge and skills acquired in different subjects, ability to see the problem and to solve it – all these competencies came in hand for students as well as for teachers.

Lesson plans, study materials created for and tested with students, articles written for colleagues based on the experience – this is the result of our project that we are eager to share with our colleagues from other countries. We will be happy if all of it will have use or will give a good kick for new ideas.

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WHAT IS YOUR WATER FOOTPRINT?

The amount of water used to produce each of the goods and services we use is measured by the water footprint. In this lesson the class explored the surprising amount of water used in producing everyday products.

12th grade students were given practice putting a design problem into perspective. By taking on the imaginary role of Sustainability Chief for a company and being tasked with better understanding the water footprints of their company's product, students practiced identifying what they know, what they don't know, and what questions to ask to better understand the constraints of a design challenge.

During the lesson the students developed their knowledge of how the goods we buy and use can contribute to our indirect water footprint, established what they already know about a problem and what questions to ask to better understand the context and constraints of a design solution, practice describing the info graphic and writing a review about the supply chain water footprint of the cola with the class, develop their communication and interaction skills, sensibility to an intercultural topic, discovering differences/similarities between cultures.

The students were to brainstorm the ways in which they use water and write down all the ideas on the virtual board in Padlet.com.

Then students gave their own definition of "Water footprint" after reading the article and calculated their water footprint using the resourse watercalculator.org. These tasks were followed by a discussion.

The next task was to review the info graphic, identifying the problems from the supply chain and making a review with the class about the supply chain water footprint of coca cola.

The lesson's final task was problem solving. Students chose a country to represent (or use the suggested one), explored the information about water footprint in the selected country using the resource "National water footprint explorer" (waterfootprintassessmenttool.org/national-explorer/).

These are the steps the students have followed:

STEP 1: Describe the water footprint of your country and of each citizen.

STEP 2: Choose another country and compare it to yours.

STEP 3: Find out how much of that footprint lies within a country (internal) and how much is related to water used for imported products or ingredients (external).

The feedback from students was very positive. The amount of water used in producing everyday products turned out to be very surprising for them. They didn't pay enough attention to the use of water in their daily life. So the students expressed the idea of improving their ecological footprint and more respectful conception of nature.

I consider the lesson to be an important step in achieving a meaningful use of water. Students were engaged in all activities, practiced putting a design problem into perspective, developing their communication skills.

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TEAM TEACHING: (ABOUT) THE EUROPEAN UNION

INTRODUCTION

The subject matter of each school subject is often perceived as something separate and sometimes even incompatible by students. Yet the world we live in is not divided into individual school subjects, it is unified, connected into a coherent whole. Knowledge is not merely a separate pile of data for each individual subject. Knowledge has to be connected, only thus it can be lasting, high quality and useful. As a result interdisciplinary is emerging and gaining ground in schools, blurring the boundaries between subjects, requiring students to integrate knowledge into a whole, which leads to lifelong learning.

THE IMPORTANCE OF INTERDISCIPLINARITY

The purpose of interdisciplinarity is to increase the active role of students in the learning process and their preparation for lifelong learning. Mostly students are not educated for a specific professional field of work later in life, but for everyday life needs and work. They will face a variety of life and work-related problems, which, unlike isolated scientific issues, are multidisciplinary. There is a discrepancy between the student's life experience and partial treatment in disciplinary school subjects, as students may know a lot about a particular subject, but this knowledge is difficult to use in problem solving. (Žakelj, 2010)

Interdisciplinarity is thus a cross-curricular (multi-subject curricular) connection, which relates otherwise separate independent subjects with an agreed connecting element or elements, in order to achieve a common, already integrated learning goal. Interdisciplinarity requires intensive cooperation between teachers in all phases of networking: from planning to implementation and evaluation. (Pavlič Škerjanc, Rutar Ilc, 2019).

Many of today's global problems are just too complex to be solved by one specialized discipline (think global warming or overpopulation). These multifaceted problems require trans-disciplinary solutions. While throughout the 20th century, ever-greater specialization was encouraged, the next century will see transdisciplinary approaches take center stage. We are already seeing this in the emergence of new areas of study, such as nanotechnology, which blends molecular biology, biochemistry, protein chemistry, and other specialties.(Davies, A., Fidler, D., Gorbis, M., 2011)

The term transdisciplinarity has also been widely used in the literature recently, sometimes as a synonym for interdisciplinarity, with special emphasis on a common, integrated learning goal.

For most authors, transdisciplinarity means combining traditional disciplines or. subjects in new disciplines or subjects so that the boundaries between them are blurred. The goals, contents, activities, processes, etc. of traditional subjects or disciplines are indivisibly merged into new entities. Such are some new optional subjects (electives), e.g. in the grammar school in Slovenia, such an optional subject is Environmental education.

Team teaching in these cases is an emergency exit, the key requirement is additional professional training of teachers whose basic professional qualification is in one or more core disciplines. (Pavlič Škerjanc, Rutar Ilc, 2019)

WHAT IS TEAM TEACHING?

Team teaching means that **teachers** together set goals for a course, design a syllabus, prepare individual lesson plans, teach students, and evaluate the results.

Type A team teaching, ie. interactive team teaching, means that two teachers (optimal number) teach the same group of pupils or students at the same time, in the same room.

Type B team teaching means that two or more teachers work closely together in planning, implementing and evaluating the learning process and identifying students' achievements. But they do not all teach the same or the whole group of students, or they do not teach the same group of students at the same time, or they do not carry out all the phases of the learning process together. (Pavlič Škerjanc, Rutar Ilc, 2019)

A PRACTICAL EXAMPLE OF TEAMWORK: THE EUROPEAN UNION

We pay a lot of attention to interdisciplinarity and co-teaching at School Centre Srečko Kosovel Sežana. We are aware that with this way of learning we connect knowledge with real life circumstances. The knowledge thus acquired therefore lasts longer and is more useful in new situations. We usually decide to choose this approach when we estimate that we will not be able to achieve the desired learning goals within a single subject.

Geography, English and IT teachers have been collaborating for several years on the topic of the European Union. In the beginning, we set ourselves a very simple goal: students had to make a poster about their chosen country of the European Union. During geography classes they chose

the country and used the literature available in the school library and on the Internet to find texts and selected statistics. During English classes they designed and translated the texts from English into Slovene, and in the IT class they made a poster. We identified several shortcomings in the first year, so we chose a different approach the next year.

So we set ourselves a new goal: **students should be aware of the importance of connecting different knowledge and skills, because only in this way can they create a good final product.** In the process students:

- develop the ability to search, collect and process information, data and concepts online;
- develop a critical attitude towards available information;
- get acquainted with various online design tools.

As a framework for achieving these goals, we selected the topic of the European Union, where curriculum for geography in secondary vocational education lists the following goals:
- students evaluate the role of the Slovenian state territory in the economic, political and cultural flows of Europe and identify its market advantages, and
- students create short geographical outlines of neighbouring countries.
The recommended activities are:

- using the Internet to produce pictorial and verbal geographical outlines of neighbouring countries,

- producing geographical representations of the countries with which their school cooperates, and

- using statistical data to make an analysis of Slovenia's position within the European Union on the basis of economic and social criteria. (Katalog znanj. Geografija. SSI. 2008)

Working process

Lesson 1: What is the EU?

A geography and IT teacher work with the class

Students learn what the European Union is and how and why it was created. They get acquainted with the values and main institutions of the EU. The information is available at https://op.europa.eu/webpub/com/eu-and-me/en/

At the same time, they make a summary - a mind map with the Mindmup program. Both teachers guide and help them in this process.

Students submit their mind maps to the digital classroom.

Lesson 2: Collecting data and images for the poster about the selected EU country

A Geography teacher and an English teacher work together with the class.

Students choose one of the countries of the European Union. During the lesson, they look for the required statistical data and images, as well as descriptions of the attractions or special features of the selected country. Students are reminded to be careful when choosing sources. We take a look at some good and bad sources. As students will be using English websites, we warn them of the difficulties of using online translations.

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Lesson3: Creating/Making a poster

A geography teacher and an IT teacher work together with the class.

We talk to the students about what a good poster should look like or what kind of poster would attract their attention. Students then design a poster in Publisher. They use the materials they have collected in the previous lesson.

Lesson 4: Creating a quiz about the EU

A geography, English and IT teacher work with the class

Students prepare a quiz about the attractions of the countries of the European Union. First we discuss what a good question is. Each student contributes one question. They also translate the questions into English and then enter it into the Google Forms quiz.

The students finally solve the quiz.

CONCLUSIONS

Both students and teachers found these team lessons as a lively and challenging disruption of the routine and monotony. We found that students show a greater interest, motivation and commitment to learning in lessons based on interdisciplinarity. Because they are actively involved in the learning process and finding solutions, they work more with the teacher and with each other. The students helped each other a lot, as they have different skills in using ICT or are more fluent in English. However, because each student had a different task, he could not just copy the result, yet he came to his result with the help of a more skilled classmate.

They had to complete the work during class, as they had to submit the assignments to the digital classroom. Since there were always at least two teachers in the class, the students got feedback faster and more easily.

Most problems occurred with students who did not listen to the instructions well or read the instructions superficially.

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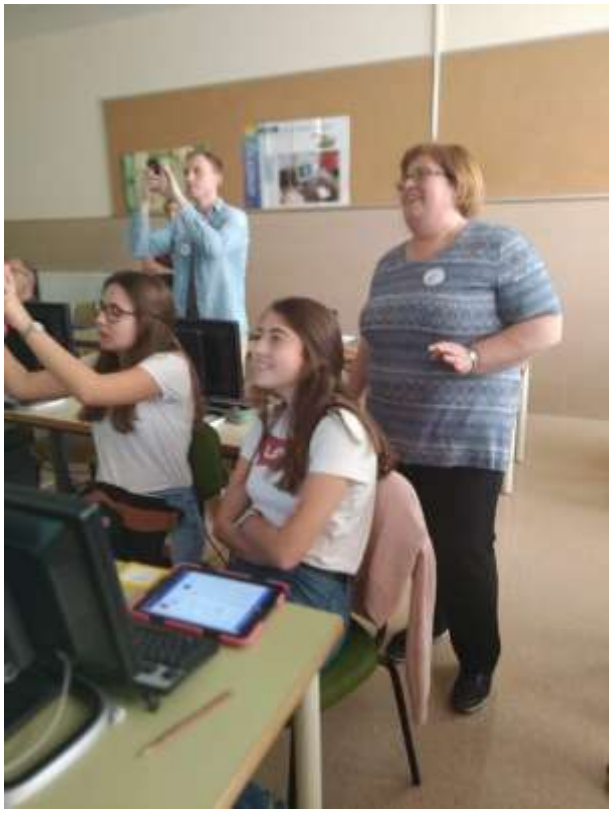

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USING SMART PHONES FOR TEACHING GEOGRAPHY

Introduction

On one hand teaching geography has never been as difficult as today. The world we live in is changing rapidly, many of the rules that applied 20 years ago are no longer true. Textbooks get outdated quickly, despite being new.
On the other, the access to different information has never been easier. In this modern world we are (literally) bombarded daily with all sorts of information. It is believed that learning by heart is no longer necessary, since there are tools that enable us to find information and data very quickly.

What is the main goal of teaching Geography?

Do students have to be able to read maps? How accurately? What geographical names do they have to know/memorize? Is it necessary for the students to be able to find countries on the map of the world/Europe, and their capital cities? Do they have to know the area and the population figures of the countries of the world/Europe?

This has not been the main purpose of Geography lessons for a long time. Their basic goal is to guide students in learning about and managing living conditions related to human natural and social living space. In the secondary school curriculum Geography is a subject that helps the

young acquire the knowledge, abilities and skills with which they can understand the local and global environment. In addition, it educates them to be able to properly value, respect and manage it. Geography knowledge is an integral part of basic education, as it contains the knowledge of homeland and the world, as well as protecting and managing the environment (Curriculum, 2008).

In knowledge-based economies it is vital to remember facts and procedures, yet this is not enough for progress and success. In our rapidly changing society the skills, such as solving problems, critical thinking, team-work abilities, creativity, IT competences (computer thinking) are more urgent than ever before. Only by using them can we achieve that what we have learnt will eventually work in real time and thus contribute to creating new ideas, new theories, new products and new knowledge (Council recommendation, 2018).

Knowing geographical names is only a means to learn geography, and to get acquainted with different geographical problems. The focus/emphasis is no longer on learning data, it is important to master analysis, synthesis and evaluation. Therefore it is necessary to include all the key competences for lifelong learning. According to **Council recommendations of 22nd May 2018 on key competences for lifelong learning (2018)** the eight key competences are:

- Literacy
- Multilingualism
- Numerical, scientific and engineering skills
- Digital and technology-based competences
- Interpersonal skills, and the ability to adopt new competences
- Active citizenship
- Entrepreneurship
- Cultural awareness and expression (Council recommendation, 2018)

Teaching Geography and digital competence

Digital literacy is the ability to use information technologies safely and critically in a variety of fields: at work, in one's free time and to communicate with others. A key component of this ability is digital competence (Javrh, 2018)

Digital competence includes confident, critical and responsible use of digital technologies and interaction with them in learning, work or social interaction. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), security (including digital well-being and competences related to cyber security), intellectual property issues, problem solving and critical thinking (Council Recommendation, 2018).

Digital literacy includes the critical and safe use of digital technology at work, for personal needs in one's free time and communication. Basic computer knowledge, such as the use of a computer to search, evaluate, store, produce, present and exchange information, and to communicate and

participate in shared networks on the Internet, is merely the basis for learning about other, rapidly evolving digital tools (Javrh , 2018).

The following digital competences are listed in the Slovene national curriculum for grammar school. The students:

- develop the ability to search, collect and process electronic information, data and concepts and use them as systematically as possible;
- enhance the ability to use information and communication technology to support critical thinking, creativity and discovering new things in different areas, at home in their free time, as well as at school and in their future studies or professions;
- develop a positive attitude towards the use of ICT when working on their own or in a team;
- develop a critical attitude towards available information
- develop a positive attitude and a sense for safe and responsible use of the Internet, including privacy protection and respect of cultural differences;
- collect, edit, process and display data on spatial phenomena and processes with the Geographic Information System (GIS) and other tools (GPS, Google Earth) (Curriculum, 2008).

The advantages of using smart phones in Geography lessons

In my opinion, the digital literacy among our students is relatively high. They do well in the digital world, some (maybe) better than teachers.
The amount of the available information online is overwhelming, yet there are a number of dilemmas: where to search for data, how to check credibility and what to do with the piece of information.
The ability to access the information fast is of great advantage, especially for Geography lessons. It offers a possibility to greatly enrich and facilitate lessons both for students and teachers. During Geography lessons students frequently ask questions to which the teacher may not have an accurate answer. The situation can be solved in two ways: the teacher looks for the data, answers after the lesson or asks the student(s) to do it at home.

I often find myself in such a situation. I sometimes promise to them to look for the answers(s) till next time. Other times I tell the student(s) to do it until the following Geography lesson. The problem is that they, or even I, often forget.
If smart phones are used to find data, the process is accelerated. The answers can be found instantly, when the topic is being dealt with.
I simply tell a student or two to find a piece of information online immediately. I suggest the webpage or the English expression to facilitate the search. Meanwhile I can continue the lesson, in addition I get the answer in a matter of minutes.

Teachers, students and parents should not perceive the smartphone only as a toy. I believe students should use their phones, not only for entertainment, but as useful educational devices. Teachers have to prepare their students for life that will almost certainly be 'digital', whether we like it or not.

Almost all the students have smartphones nowadays. There is no general ban of their use in Slovene schools. Each school decides to regulate their use with internal school rules.

Management, teachers, parents and students should be involved in the preparation of the rules regarding the use of smartphones at school. Teachers decide how to use them in the learning process.

At our school students are allowed to have their phones with them (at all times), but they are not allowed to use them during lessons. They can only use them when the teacher allows it for the learning process.

There should be no discrimination against those students who do not have a phone. The teacher can organize the work differently, putting students together in pairs. During Geography lessons students frequently work in pairs.
Unfortunately I rarely get the opportunity to work in an IT classroom. When I do, I am there with an entire class (25 to 30 students) which means that two students have to work at one computer.

Examples of using a smartphone in geography lessons

Example 1: LOOKING FOR SIMPLE DATA

While discussing different geographical topics figures cannot be avoided, be it the area of a state, population, population density, birth rate, GDP, HDI, percentage of people living below poverty line etc. Nowadays accessing these data is easy, therefore there is no need to learn them by heart.
How it works in the classroom during lessons?
For example, we are interested in the number of inhabitants of a state. First I would ask students if anyone knows. If there is no answer, I encourage students to estimate. I put the figure(s) on board, meanwhile a student finds the figure online.

Example 2: LOOKING FOR WEATHER AND CLIMATE DATA

We are studying the climate of northern Europe. In the textbook we check the map with average January and July temperatures, and the map with the average yearly rainfall.
As this topic is dealt with in December, the students always want to know what the current temperatures in that region are. Each pair is assigned a country. In the atlas one student has to find two places that are relatively distant from each other, the other student finds the current temperature for both places. Sometimes the snowfall is checked as well, or the absolute highest and lowest measured temperatures or similar.
The students use the webpages they would normally use to check the weather forecast. I usually direct them to a suitable webpage to find more specific information

Example 3: LOOKING FOR ETHNICITY DATA OF A PARTICULAR COUNTRY OR REGION

When dealing with south-eastern Europe the reasons and consequences of conflicts are researched. The students are divided in groups, each group has to find data about the ethnicity of a particular country. They have to find the latest data and the data for 1991. They have to find out when the last census was conducted and whether there were any problems, paying attention to the interpretation of the census data. They upload the data into a shared Google Drive document and then present it to their classmates.

Example 4: ASSESSING KNOWLEDGE

The smartphone proved very useful for consolidation and assessment. Before written testing I usually open a Google Drive document. Each student types a couple of questions related to the topic to be tested. I check and correct the questions. Then we answer the questions in class. Thus the students have a set of possible questions for the test. I use many of the questions in the real test.

Example 5: CHECKING (MONITORING) CURRENT WORLD EVENTS

When dealing with a particular region of the world students are supposed to check the daily papers and follow what is going on there. At the start of a lesson I ask them to check online papers for the news from the region in question.
In 2018 there was a lot of news on the demand of Greece that Macedonia (its official name then was – Former Yugoslav Republic of Macedonia – FYROM) should change its name. Europe is in the curriculum for the 3rd year of grammar school. In January 2018 we were dealing with south-east Europe and mentioned the problem with the official name of Macedonia. After that I asked the students every week if there was something new regarding the name.

Example 6: ORIENTATION

The smartphone can be very useful in spatial orientation. In the past we used a compass and a map, but today smartphones allow us to plan the route to the chosen destination much more easily. They are an excellent device for orientation and for obtaining information about the landscape through which we are travelling.

Conclusion

In my opinion neither smartphones nor tablets can substitute classical teaching methods, yet they are very useful. Personal contact between students and teachers is still very important. We are especially aware of this during the period of distance learning.
Using a smartphone can enrich and update lessons. Students can work more individually, yet the teacher has to provide guidance, direction, and supervision.

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KEEP TALKING AND NOBODY EXPLODES

At first glance it does not seem that a game with the name "Keep Talking and Nobody Explodes" and education would be a good combination. But if we take a deeper look at what the game requires for success it begins to make more sense.

The main goal with playing "Keep talking and nobody explodes" is to practice and develop collaboration skills, improve the student's concentration, and help them improve in creative thinking. It is also a good game to help students learn to read and speak foreign languages.

Competences developed through the lesson could be computational thinking, transdisciplinary and design mindset.

The game was tested in Collegi Sant Roc in Alcoy, Spain during October and the pupils that tested it was at age 15-16 years old.

In this lesson I used the game "Keep talking and nobody explodes" downloaded from https://keeptalkinggame.com/. The game is also on Steam but since Steam is not allowed at the school network, I had to download from the website. The bombmanual can be downloaded from http://www.bombmanual.com/ in many languages and some unofficial manuals can be downloaded from https://bombmanual.github.io/

To play the game you divide the class into groups of each 3-4 students. The groups take turns on who is observing and who is playing the game. Each group then decide which student plays the role as "disarmer" (1 student) and the rest of the group plays the roles as "bomb experts". The teacher gives the group time to study the bomb manual and to make a strategy on how to divide the tasks required to disarm the bomb. The groups that aren't disarming are observing to give

feedback to the bomb groups communication and collaboration skills. If the communication is bad, the bomb explodes. You could only make three mistakes. Then the next group play the game.

The feedback I got from the students was very positive. They had never played a game like this and they were very enthusiastic and engaged. The immediate reaction: can we play more. They experienced the importance of practicing communication skills to solve problems.

What did I like about my lesson?

I liked that the students got so engaged and that everybody agreed that they learnt some communication skills. I wished I had more time so they could play more rounds. Then we could try to have the disarmer and bomb expert in different rooms so they could have tried communicating with mobile phones and not hear any response from classmates etc. Then the students could see how much body language have to say for good communication.

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MATH WITHOUT BORDERS

Thanks for the participation in the project I have more tools to use in the classroom as well as for distant learning process. In this article I would like to share my experience of possibility for teacher to use various tools in math lesson. For this purpose, a fragment of the lesson on the topic "Solving exponential equations by equalizing indicators" the interactive poster Glogster, an online whiteboard Padlet; test created in Quizzizz were used.

Type of lesson: a lesson to discover new knowledge; therefore the motto of the lesson was "the best way to learn something is to discover it yourself".

Competence: Computational thinking

The formation of this competency is facilitated by such objectives of the lesson as:

1. Student is able to hypothesize independatly in order to create an algorithm for solving exponential equations.

2. Student is able to formulate an algorithm for solving exponential equations by the methid of equalixing indicators.

3. Student is able to present the finished product through the interative whiteboard Padlet.

A fragment of this lesson was held with students of grade 10 in Slovenia, on May, 2019. Since the topic "Exponential equations" is studied in Estonia only in the middle of the grade 11, it was decided to use the method of discovering new knowledge to solve the simpliest exponential equations. At the same time, tenth-graders could rely on previously studied material on th etopic "Degree of Poynomials".

At the stage of motivation, so that students internally gather, prepare, and aim at "conquering new hights", the teacher opens the interactive Glogster poster. The epigraph to the lesson is the statement of the great Russian scientist M.V.Lomonosov: "Let one delete the degree in math, and one will see that without it no one will go far".

The updating of reference knowledge (the first block of the interactive Glogster poster) of the topic "Degree of Polynomilas" took place in the form of game-test in Quizzizz using students' mobile phones. A distictive feature of such tests in Quizzizz is that the whole class has he same taks, however, each student recieves on his mobile phone questions in a random sequence/ and works at his own pace. At this stage, students recalled and generalized the properties of degrees.

At the stage of th discovery of new knowledge, students' attention was drawn to the seconf block of the interactive poster Glogster. Understanding what an algorithm and exponential equation are is what allowed us to move on and complete the task. At this stage, students had the idea that the properties of degrees can be applied to the solution of these exponential equations. Sovling the equations and checking them, the students realized that the initial conjecture was correct. Having described the course of their reasoning, they finally got the required algorithm, which they added to the Padlet online board.

For the lesson fragment, the simplest exponential equations where chosen, for instance:

a. $3^x = 3^2$
b. $5^{3x+1} = 5^2$
c. $2^{8x-3} = 4$

Feedback from students was quite positive. They liked the use of various digital tools and gadgets at a math lesson. It was suggested that if all the lessons were held in this format, they would know and be able to do much more. At the same time, some students lacked the instructions and explanations from the teacher, as some did not know what the algorithm was and all of them used Quizizz, Padlet and QR Code Reader on their smartphones for the first time.

At the lesson, I really liked the performance of Slovenian students, their bright eyes, surprise, desire to learn, their openness to everything new. The format of the lesson I would have left the same but would have given clearer instructions on how to enter this or that platform. In general, it was a very positive communication experience for both the teacher and students.

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DESIGN THINKING

Introduction

Teaching marketing an entrepreneurship has always been very challenging and dynamic, but never so fast evolving as it is nowadays. First the internet and now the social media had already changed the theory behind it. Every study book and a freshly prepared research can be already outdated in the same moment you find it in a book, paper or even on the internet. Challenges are more and more complex and interdisciplinary. If you want to succeed, to be noticed and to place yourself in the complex world market you have to think differently. When you start to develop an idea, you have to picture immediately the impact of your idea. Design is not »ego« centered anymore. It become customer centered. A designer, the "ideator" of a new product has to »teleport« himself into a body of the customer and understand his needs. Is it possible to teach students to think in this way?

Design Thinking or Brand Strategy?

Ten years ago I came across a book named Design thinking (Integrating Innovation, Customer Experience and Brand Value). I was searching for more information about branding and brand strategy so it intrigued me. I studied it and found some definitions about design thinking.

Design thinking is essentially a human-centered innovation process that emphasizes observation, collaboration, fast learning, visualization of ideas, rapid concept prototyping and concurrent business analysis, which ultimately influences innovation and business strategy.

I was in the middle of an experiment about entrepreneurial learning in general education. I was also designing curricula for a subject entitled Creative Entrepreneurship. And I was asking myself

where was the difference between my idea of Creative Entrepreneurship and Design Thinking? And I searched for more. Another definition.

Design thinking is a methodology that provides a solution-based approach to solving problems. It's extremely useful in tackling complex problems that are ill-defined or unknown, by understanding the human needs involved, by re-framing the problem in human/centric ways, by creating many ideas in brainstorming sessions, and by adopting a hands-on approach in prototyping and testing.

And another.

Design thinking is a non-linear, interactive process which seeks to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test. The method consists of 5 phases—Empathize, Define, Ideate, Prototype and Test and is most useful when you want to tackle problems that are ill-defined or unknown.

And one more that made me put something in brackets:

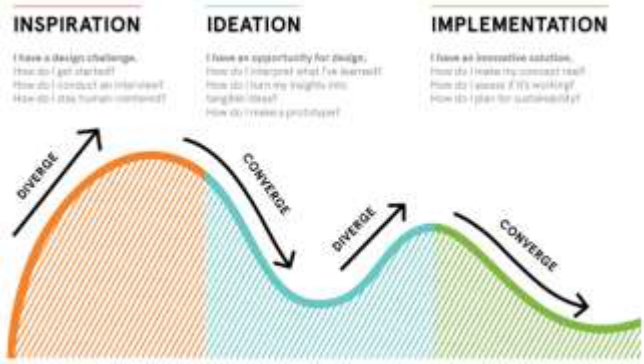
Design thinking is a methodology "used by designers" to solve complex problems, and find desirable solutions for clients.

Ok. It is true. It is used by designers and other people without entrepreneurial and marketing knowledge. Entrepreneurship and marketing teachers use the same methodology in teaching since I started in 1998 or even before. And then I found the definition that confirmed my statement.

„However, the more I now ponder design thinking and its methodology, the more intuitively it seems to fit into the world of brand strategy and marketing". Wayne Atwel, marketing and brand strategist

The most important thing is not to debate how to call this method but to try to teach students to solve problems and real challenges. We practice this simple process when we teach students to do different projects. Every task that they have to do has always 3 parts:

1. Inspiration (research, brainstorming, finding the answer to a question WHY should we do something, find the purpose…)
2. Ideation (planning, designing, sketching… HOW should we do it)
3. Implementation (creation, testing, changing, modifying, evaluation … WHAT did we do? Is it working??? Is the customer satisfied?)



Picture 1: 3 phases of Design thinking

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Design thinking method

Since 2008 the design thinking method of teaching entrepreneurial skills became very popular especially among designers. An unexpected gap between designed products and customers' needs lead to the evolution in thinking about design.

Design thinking has been developed from methods that originally come out of the practice that doesn't focuses only on the final form, but on a principle of developing products and service. (Brown, 2008).

Today's design is not just the finishing touch, which gives a product aesthetic elements that make it more attractive to end users.

Nowadays, in addition to aesthetics, designers focus on usability (Brown, 2008). The main features of design thinking:

- Focusing the end user and try to understand it with different approaches
- Creativity: finding solutions that do not yet exist
- Holistic: solving a problem entirely
- Transdisciplinarity: involvement of individuals with knowledge of new ideas from different fields
- Experimenting: need to try

In the literature, we can see that some mention three phases through which design thinking goes, others extend this process to five phases or even seven phases. The differences occur because some combine several phases into one. Brown (2009) defines the 5 phases:

(1) empathic understanding of the user,

(2) defining the problem,

(3) acquiring and shaping ideas,

(4) prototyping, and

(5) testing.

Picture 2: 5 phases of Design thinking

The key stages are understanding the end user, because after all, without an in-depth understanding of users, it is difficult to determine what exactly is the problem we want to solve.

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PRESENTATION OF METHOD

PURPOSE: We use design thinking whenever we face complex challenges that involve the individual. Thus, it does not make sense to use design thinking when we face challenges that are easily solvable or that the solutions are closed in nature. It makes sense to use it when we want new, innovative solutions, when we are aware that we will need a longer time until the final solution, so we are not in severe time constraint.

TARGET POPULATION: Design thinking is intended for all who want innovative solutions to challenges encountered. There are no restrictions in what situations it can be used, so it can be used, for example, in the transformation of business models, changes in organizational culture, complex societal challenges (health, education, climate change), problems that affect different stakeholders or change markets and behaviors. We need to keep in mind that design thinking is a longer process and it does not make sense to use it in cases where we want quick solutions.

PROCEDURE OF IMPLEMENTATION: As mentioned above, there are different definitions of how many stages we go through in design thinking. The above are the five stages or below seven stages have the same purpose.

Picture 3: 7 phases of Design thinking

Example of design thinking – Service design – Top Anniversary

The digital tools used during this learning unit were:

- https://www.google.com/search/about/
- https://www.canva.com/sl_si/
- https://docs.google.com/document/u/7/
- https://drive.google.com/drive/u/7/mydrive
- https://www.microsoft.com/enus/p/movie-maker-10-free/9mvfq4lmz6c9?activetab=pivot:overviewtab
- http://www.photofiltrestudio.com/pf7-en.htm
- https://office.live.com/start/powerpoint.aspx

and social media:

- Instagram
- Facebook
- Youtube

The inspirational materials we found on the web were:

- **https://www.youtube.com/watch?v=k5y4bLU5X4 (10 years movie about reunion)**
- **https://www.entrepreneur.com/article/345182**
- **https://www.youtube.com/watch?v=4J6odn3oSY**
- **https://www.youtube.com/watch?v=IXjdcpfXoI**

When we think of design, we usually think about product/industrial design or graphic design. Less commonly we talk about service design. Service design is the activity of planning and organizing people, infrastructure, communication and material components of a service in order to improve its quality and the interaction between the service provider and its users. Service design may function as a way to inform changes to an existing service or create a new service entirely.

TOP OBLETNICA/TOP ANNIVERSARY

At the beginning of the school year a group of students established a mini company (Junior achievement) Xevents. The main activity of a company was the management of events. The running of a company is a interdisciplinary project that includes 5 subjects: arranging, visual communication, multimedia advertising, marketing and sales promotion. During lessons of sales promotion we decided that we cannot wait to get an order for a random event. We decided that we should design a service that can sell. We used the design thinking philosophy.

As usually we started our project with the first part:

1. INSPIRATION: in this part we had to find our target audience, but before that to define our resources. Our statement was:

- MATERIAL RESORCES: we can use school's spaces for our activity. We can use material and tools.
- HUMAN RESOURCES: our students have different competences (graphic design, video, photo, decorating…)
- CAPITAL: we had 330,00 EUR of initial capital (acquired by selling company stock).

We brainstormed about we could do with this resources and who could be our target audience. The ideas were: movie nights for students, school's disco and other alternative solutions. The Aha! Moment (also known as the Eureka moment) came suddenly as usual. »Why we don't organize the anniversary of generations that finished our school? « And immediately we had a wide target audience (40 generations, approximately 100 students per generation and we had a total of 4000 potential customers). Once we had defined our user, we started to **emphasize** with our user and ask questions:

- What would he like to do or to see after many years in our school? – VISIT OF A SCHOOL
- Who would he like to meet? – THE HEADMASTER; SOME TEACHERS
- What can we offer to satisfy his expectations? – FIND OLD PHOTOS, MAKE NEW PHOTOS, MAKE A VIDEO OF THE GENERATION REUNION AFTER MANY YEARS

By asking questions we **defined the problem** and we already had the answers, so we started with the second phase:

2. IDEATION: in this part we started to design our service (**acquiring and shaping ideas**) by giving an interesting name that could become a brand. We chose Top Obletnica that means TOP Anniversary and we shaped the offer and defined the price and decided that we can offer to organize the events on Fridays. We asked the headmaster fort he permission and he agreed. We ask him also if he would be so kind to come to the event and welcome the former students of our school and he was enthusiastic.

So the next step was to **prototype**, in our case to see if we could find some customers that will appreciate our service. So we entered into the third phase:

3. IMPLEMENTATION: we designed a flyer and put it on our school's Facebook page. The audience of our FB page is broad and it includes former students and parents of our students. We offered our service and waited for reactions. It was the **testing** phase.

Picture 4: Flyer

Many people liked the post and we decided to contact them and ask if they are interested. So we had a contact person and a first customer The generation that graduated in 1987. And we had a date: Friday 28th of February 2020. So we designed the invitation, prepared the google document to gather participants data (according to GPR we asked for the permission to take and publish photos), prepared the presentation (What happened in 1987), invited our headmaster and their class teacher, ordered the catering, prepared all the accessories for photography, graduation hats and promotional boards, decorated the school's canteen with the covers of school magazines and photos of the generation 1987, we decorated the catering room and ordered a cake and we ordered t-shirts for the staff, made a deal with a local pub to offer one welcome drink at 22.00 when we decided that our event in the school will be finished …

We really organized the event and it was a success. There were 30 people, their class teacher and the headmaster and they were more than satisfied. We got 2 more orders: Generation 1994 on the

13th of March (cancelled due to Covid-19) and Generation 1990 on the 17th of April (cancelled due to Covid-19).

Picture 5: Invitation, decoration, memory

After the event we prepared a video memory and a photo gallery. We evaluated the event and understood that it was planned and organized perfectly and that we have a perfect service. When we did the report we described all the phases and the marketing mix 7-p of our service. (Product/service, Place, Price, Promotion, Physical evidence, Process and People).

Summary

By using this 3 phases when trying to solve a problem you cannot fail. Design thinking or Brand strategy is the right way to work with art students. It teaches them to research, emphasize, design, think implement and be professional.

Students evaluate the learning unit as very good. Here are some statements that point out the competences that they developed (team work, self-consciousness, self-esteem, communication skills, empathy, critical thinking, design thinking, interdisciplinarity):

»We understood each other well, we also learned a lot from each other.

We have built a good communication relationship.

Communication is very important in solving problems.

This experience gave us a lot. We shared the working tasks and were happy to help the others if needed.

We found that teamwork is important, no matter what. By working together strongly and harmoniously, we can create an amazing experience.

During the implementation of activities, we also came up with various new ideas that could help us in the future, as we received the order for two more Top Anniversaries, but unfortunately we were not able to realize them due to the C-19. We believe we would be successful!!!

LITERATURE

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MUSIC IS INTERNATIONAL

In the project "Learn it today to manage it tomorrow" one of two music lessons was put into practice, using digital materials that were specially designed for that purpose.

The lesson was held for 10 class students of the school centre Srečko Kosovel Sežana (Slovenia) by Julia Polshtshikova, the teacher of Kreenholm Gymnasium (Narva, Estonia).

The main goal of the lesson in the international group of project participants was to show that the musical communication language will help everyone to understand each other and ultimately get an interesting product of joint musical creativity!

The theme of the lesson was "Music Around Us". General competencies developed during the lesson were, first of all, intercultural competence (listening and analyzing works of Finish composer, French song performance in different ways and different languages), as well as computational competence (performance of tasks by analogy).

There were digital tutorials designed for the lesson that were uploaded in https://prezi.com/view/yuQUHinwleLXaUPMRl51/. For delivering educational materials a set of eight bells with a certain pitch, improvised items such as pens, pencils, etc. and a presentation prepared in the Prezi program were used.

During the lesson, students completed two different musical tasks.

In the first task, "Orchestra without musical instruments," students tapped the rhythm in different ways, turning their body and objects at hand into different percussion instruments. Then they listened and analyzed the work of Jean Sibelius *Water Droplets* and performed a beautiful rhythmic accompaniment for this work.

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In the second task, "Eight sounds of one musical instrument", students used their ear for music and placed the bells in the correct order, learned how to play them and listen to each other, and then listened to two different versions of the song *Brother Jacob*.

At the end of the lesson, the students all together performed the instrumental version of the song *Brother Jacob* on the bells and eight students under the guidance of the teacher-conductor turned into one musical instrument. According to students' feedback, the lesson material was interesting and understandable; mostly they liked the unusual musical tasks in the lesson. For the first time, they used their body and improvised objects as percussion musical instruments, and for the first time they played on bells of such different pitch. At the end of the lesson, students expressed the wish to try themselves in the role of a conductor.

The lesson was an interesting experience of teaching for an international group.

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Evaluation with Socrative

Socrative is a kind of application that can be accessed on the top three operating systems: Windows, Apple, and Chrome. No downloads are required. A web browser that utilizes HTML-5 is needed to access all functions. Socrative is also usable on various hardware: desktops, smartphones, tablets, and mobile phones. Further, Technical help is offered via a web page that offers tips and answers frequently asked questions presented by users.

The type of lesson that we talk is Evaluation and the general competencies developed during the lesson are **Computational thinking, Design mindset, transdisciplinarity (TEC, ICT)**. In addition, the digital study materials developed for the lesson are at https://b.socrative.com/login/student/.

The three main objectives of the lesson are encouraging the students cognitive and connective abilities, evaluating the knowledge of the contents of the subject and using digital devices.

To achieve these objectives and to do a right lesson, we take in account that Socrative is a formative assessment tool which allow teacher to check understanding of all students during a lesson. It's designed for use in class, in real time.

Socrative is a cloud-based student response system developed in 2010 by Boston based graduate school students. It allows teachers to create simple quizzes that students can take quickly on laptops – or, more often, via classroom tablet computers or their own smartphones.

The quiz allows teacher to create multiple-choice, true/false or short-answer question quizzes that they can save and use again. It means that in class the teacher launches the quiz and students complete it in real time on their devices. As students answer the questions, the teacher can see

the results and then download them. And finally, the teacher can then make more informed decisions about what happens next in the lesson.

Some of the advantages of using Socrative are: Visualize student understanding, ask multiple choice and true/false questions, ask open-ended questions and vote on the results, create your own quizzes (instantly graded for you), share quizzes with other teachers, give end of class exit tickets, play games with our space race, view students result in real time and reporting – Download, Email or send to Google Drive.

These are the steps to carry out the lesson:

1.You have to go to socrative.com and click *TEACHER LOGIN*. You can sign up for free account or use your existing Google account.

2. Students don't need register, and will only enter their names later. **This is the room name to give students**.

3. Upon signing in, you will enter your DASHBOARD. You may not have created a quiz yet, so click on MANAGE QUIZZES.

4. You can see a new set of options will appear, click on CREATE QUIZ to start the process.

5. You have the options of creating MULTIPLE CHOICE, TRUE / FALSE or SHORT ANSWER questions.

6. You can create as many questions as you'd like, and the procedure is quite straightforward. You can also optionally include answers if you want the system to generate the marks automatically.

7. Once satisfied, go ahead and click SAVE & EXIT for the next step.

8. Take note if want to share. You can insert the number assigned to your quizz.

9. You will be sent to your dashboard again. Now click on START A QUIZ to use the quiz that you've created earlier. You can recycle the ones you have used before as well as they will be stored in the system for future use. Click on the quiz you want to use.

10. Is recommended to turn off to capture student names in report

11. Select the type of quiz you like, and click START to begin the quiz.

This lesson has allowed us to know a new methodology when evaluating our students. This provides us with speed in correction and also clarity in what is asked of the students. Also you could also use Socrative to assess reading or listening comprehension or to add information about why an answer is correct in the "explanation box" which could be very useful for exam classes.

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Mathematical geography

General competencies developed during the lesson were transdisciplinarity, design-thinking and virtual cooperation. Design thinking is a process of using empathy, group ideation or brainstorming, prototyping, and testing to solve problems and create new products. As more teachers look for new problem-solving strategies, the experience of using the design thinking is quite important.

The lesson was in the 9th form. Digital study materials for the lesson were created using platforms thinglink.com, purposegames.com, Google Docs and for students answers – Padlet.

Main objectives of this class project were as follows: students understand the definition of "percent, percentage"; students know the notion of a chart, they are able to apply basic formulas to calculate the percent and to analyze information and highlight the most significant information, generalize, systematize and present it.

The task for students was based on this example; make the analysis and synthesis of the received information, discuss in groups and make a development plan for your project. The discussion should lead to an understanding of what needs to be done and how it will look like.

In the first lesson students worked in pairs, which allowed them to discuss ideas, supporting and motivating each other. For the next lesson, they needed to make a plan for their project, and find the material.

Students presented the result of the group work through interactive tools like Google Docs or Padlet. And at the second lesson students created their own project. The project could had been prepared at home and completed in class.

For me as for a teacher these couple lessons were very good and students really liked to work in teams in order to plan, to create and to follow their plans.

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Transmission of Content and Evaluation through Playposit

Playposit is an interactive web-based video platform that allows educators to provide formative assessment both inside and outside the classroom. Teachers are able to embed quiz-type questions into videos on Youtube, Vimeo, Khan Academy and other popular video platforms. Data can then be analyzed on the individual or group level, provided powerful insight into educational trends in the classroom.

The type of lesson that we talk is transmission of contents and evaluation and the general competencies developed during the lesson are Computational thinking, Design mindset, transdiciplinarity (TEC, ICT). In addition the digital study materials developed for the lesson are at www.playposit.com.

The three main **objectives** of the lesson are to give Students benefit from an engaging and differentiated, computer-based experience, to use digital devices and testing and help the Students to achieve a whole-school alignment of blended learning.

Concerning with the **methodology**, we consider the that the bulb is an interactive video created in PlayPosit. The steps we need to carry on are to transform any video into an active experience for students by embedding questions, images, audio, and other media elements; to add any of the premium question types to make your video engaging for students; and check the student participation and responses.

The Analytics tab provides you with a broad overview on student performance including score, total time spent, and their progress across all bulbs assigned to the course.

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We can highlight three essential steps to be able to carry out a lesson with www.playposit.com. Previously, during the lesson, after lesson.

A) PREVIOUSLY (teacher)

At first, teachers must **register** as an instructor in this web, they can start to work on.

1. **Create a bulb and adding a video.** In My Bulbs, click New Bulb to open the designer, Select You Tube, search for a video, select one, and click Done. Click the button labeled "Add and Interaction" to insert a question at your current playback timestamp. When you're done adding your interaction's text and answer options, click Done to save and close the interaction.

2. **Create a class and adding students.** Click on Classes. Click Add new class, title it, and click save. Students enter Search code. Students individually log in to their Playposit accounts, click add class, and enter your instructor **search** code.

3. **Assigning bulbs**. In My Bulbs, click the triple dots icon at the right for the bulb you want to use and click Assign. Select a due data for the class you want to assign this bulb to and click ok. You should get a green toast notification indicating that your bulb has been successfully assigned.

4. **Monitoring responses.** Click Monitor for the specific class. You should see all of that class's responses for this bulb.

5. According to the premade Bulbs, we can **filter all premade,** classify by grade and topic., copy bulb and edit bulb.

B) DURING LESSON (Students) This lesson was held in Slovenia with content from the area of technology that's the reason why we choose "pulleys" from premade bulb for technology class. These are the steps for the students:

In case of students, these are the steps that they must follow to work on www.playposit.com.

1. Students must enter at www.playposit.com and click *STUDENT LOGIN* in the main page.

2. Then they notice that they just need to know the Room Name and click *JOIN ROOM* to begin, thus reducing the need for tedious registration process.

3. Once they entered their names, clicking *DONE* will lead them to a page where they wait for the teacher to start the quiz (if he/she has not already done so).

4. Use PREVIOUS and NEXT instead of FINISH QUIZ. Students can choose which to do first.

5. When the teacher starts the quiz, the student will automatically see the question and an answer box. Depending on the type of quiz set eariler, the teacher has the flexibility of choosing the pace of the quiz. Remember to tell them to click *FINISH QUIZ* only after they are satisfied with their answers. A waiting screen will appear once they are done.

6. Finally, toggle off to show on screen. Tick signifies student has finished quiz.

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C) AFTER LESSON (Teacher)

1. On the teacher's screen, he/she will be updated on the progress of all the students in real-time. This is a good chance for the teachers to either discreetly monitor or choose to show the class how they are doing so far.

2. Once the time is up or when all have completed the task, click *FINISH*. You are now ready to generate your report. For now, Click on *TO DASHBOARD* to return to the homescreen.

3. Check the number of students in room and turn on all to generate reports to give students, save soft copies and take note of date to get correct reports. Click on *MANAGE QUIZZES* as before and click on *REPORTS*. You are given many options of how you want to generate the reports.

4. Finally, *DOWNLOAD* will save a zipped file into your hard drive, and a few sample of how they appear is in the next page.

At the end, this lesson supposed a good feedback from teachers and students since they could see that they have increased their ability to teach and learn through newer methodologies.

You could also use www.playposit.com anywhere. So this enables its students to also use at home, on their own without needing help. The application is not just for use in schools. You can share with your students an Independent Practice that can be assigned as homework.

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3D Modeling class

Why the ships are floating but the anchor is dipping down? In the lesson, students are given the task to find an answer to a problematic question by designing two models, conducting an experiment with them and presenting the results of their experiment to the class. During this activity students get acquainted or repeat the law of Archimedes (the law of floating bodies) that they had studied previously. For solving this problem, 3 lessons were required. The lesson took place in the 11 form at the end of the 3D modeling course.

General competencies developed during lessons included design-thinking and transdisciplinarity. The aim of the group of 3 lessons was to figure out the mechanism of floating bodies using the law of Archimedes (the law of floating bodies). During these lessons following methods were used: group work, demonstration of experiment, modeling 3D-models on a computer, setting a task, conducting an experiment, presenting the result of the teamwork. Learning materials used for these lessons included digital material in the form of Google-presentation.

As an example following task was given: In the 3D-design program, simulate two 3D different shape models, conduct an experiment and present the results of the experiment electronically. The task was difficult enough to keep students interested as well as motivated to find the solution.

Students gave a positive feedback to these lessons. Even though they already knew the law of Archimedes, during the experiment they made new discoveries for themselves.

As a teacher, I liked demonstration of experiment, the presentation of the results of the experiment, the objects simulated by the students. However, the most important was that students were able to find links between theoretical material and practice.

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First Aid

The main goal of the lessons is to prepare student for their future as health workers. In the lessons, students are given knowledge and skills on how to examine and recognize symptoms of an acute illness or injuries to a person and to perform the basic first Aid and CPR if needed. They are also given the opportunity to practice and develop their communication skills required as competent health workers.

General competencies developed during the lessons were cross-cultural competency, computational thinking, and design mindset.

In the project "Learn it today to manage it tomorrow" one part of the lesson was put into practice, using digital devices and Nearpod. Nearpod is a student engagement platform designed for use in class. Nearpod is a good way for teachers to introduce a new topic where the teacher gets to interact with students and view students responses in real time, enabling students to take ownership of their learning rather than passively viewing a teacher directed whole-class presentation.

The lesson was held for 5-6 students of the age of 15-16 at Collegi Sant Roc in Alcoy, Spain, in October 2019.
Learning materials used to prepare the lesson was based on the curriculum and textbooks related to the relevant vocational education. The main points were transferred to a Powerpoint which was then downloaded to a Nearpod account for adding activities.

Examples of activities given in the Nearpod presentation: draw a situation that requires first aid, open ended questions and the last learning activity to sum up the understanding of the lesson was "Time to climb". "Time to climb" is a multiple-choice quiz game that allows the students to see each other's progress and at the end of the game they will see the students with the highest score on a podium.

Students gave a positive feedback to the lesson. Even though they had experienced Nearpod before, their feedback on this lesson was that it was more playful and competitive then previous Nearpod lessons.

As a teacher I like that Nearpod gives me the opportunity to interact with the students in a more active and joyful way then a normal teacher presentation would allow me too. It also enables me to see the students learning outcome by viewing the individual reports of the students at the end of the lesson.

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Lessons Learned with Pecha Kucha

PechaKucha is a dynamic presentation method developed by two Tokyo-based architects as a way to maximize the exchange of ideas while keeping the audience's attention.

Problems and Purpose

PechaKucha is a dynamic presentation method developed by two Tokyo-based architects, Astrid Klein and Mark Dytham, as a way to maximize the exchange of ideas while keeping the audience's attention. Given less than seven minutes, each presentation consists of 20 Powerpoint slides which, given that this method is mostly used by the creative arts community, typically consist of images and, in some cases, videos.

The name 'PechaKucha' comes from the Japanese ペチャクチャ meaning 'chit chat'. PechaKucha as a method should not be confused with PechaKucha Nights (PKNs) which, while using the presentation format, are actual city-wide events with designated organizers. Usually held yearly, there are over 900 cities with 'registered' PKNs. The 'registration' process is informal – called a 'handshake' by Klein and Dytham – and is renewed yearly. It is expected that there is only one official PKN per city but anyone can use the format as long as they clear it with the official group or if they simply borrow the method for their own event.

The method was designed as a way to draw people to what might typically be thought of as 'dull' or 'dry' presentations. Powerpoint slides are notoriously 'bland' so Klein and Dytham created PechaKucha Nights (PKN) as a way to capture the attention of young designers and architects. The method is also useful in many other contexts including academia since the high presenter turn-over rate allows for a large number of people to both share their own ideas and hear those of others. As the creators put it: "architects talk too much! Give a microphone and some images to an architect -- or most creative people for that matter -- and they'll go on forever! Give PowerPoint to anyone else and they have the same problem."[1]

The creators also note that, since its creation, PKN has filled an important gap in the public sphere – short of getting published in a magazine or having enough pieces to display in a gallery, most young artists (or any graduates, for that matter) have no where to share their work. PKN provides the perfect answer since it can be set up anywhere and, given its short format, participants can range anywhere from the complete amateur to the experienced academic.

Origins and Development

The first PechaKucha Night was held in 2003 at Klein and Dytham's "gallery/lounge/bar/club/creative kitchen" *SuperDeluxe* in Tokyo.[2] Since then, over 900 cities have taken the 'handshake' with the creators and set up their own PKNs often held yearly. Pecha Kucha as a method has most likely been held in thousands of contexts but, since they are not specifically allowed to be advertised as PKNs without the go-ahead from their city's official organizer, it is difficult to get an exact number. As the creators make clear, this method can be used anywhere, anytime – they give the example of a family get-together when numerous relatives want to share holiday photos.

How it Works

An important aspect of the PechaKucha format is it's simplicity. The youngest presenter is recorded as being 5 years old which the oldest was 69. The participant selection method can therefore be tailor to the focus or theme of the event itself rather than the methodology. For example, PechaKucha was recently used during public consultations on Melbourne's 'Future 2026' comprehensive long-term municipal development plan.

PKNs can be held anywhere and the creators note that, since their development, PKNs have taken place in "bars, restaurants, clubs, beer gardens, homes, studios, universities, churches, prisons (disused), beaches, swimming pools, even a quarry!"[3]

While the number of presenters depends on the size of the event and the organizer's intentions, the PechaKucha method stays the same. Each presentation consists of 20 slides set to advance automatically every 20 seconds to allow the maximum number of speakers while leaving time for audience interaction between sets. Owing to this unique format, PKNs have become known as the "20 x 20" method for their 20 slides for 20 seconds.

One of the important features of the method is hinted at in its name 'PechaKucha' which means either 'chit chat' or, more literally, "the sound of conversation."[4] This method is very different from the one-way Powerpoint presentation common in most office boardrooms. It is meant to excite reaction and to encourage a dynamic performance from the presenter, one that gets the audience excited about their material while also imparting a large amount of information.

Analysis and Lessons Learned

The success of the original PechaKucha, while not officially documented, is obvious – just a year later the method had already made its way to Europe and, as of May 2016, over 900 official PKNs have been held across the world.

While it is impossible to determine how far reaching the method has become, it's likely that PechaKucha has or will be used in all contexts where Powerpoint presentations or other speaking events have been organized. In Australia, the PechaKucha method was used in service of a larger public consultation initiative which was ultimately successful. The PechaKucha was held alongside 30 other public engagement innovations such as design hacks and pop-up events. The

topic, urban perspectives on future growth and development, demonstrates the method's versatility.

It's rather telling that the method has not changed since its first inception – its simplicity is perhaps its most lasting feature. By keeping each speaker to under 6 minutes, organizers can choose to maximize the number of speakers or, alternatively, use the extra time for more audience interaction. This makes the method perfect for deliberative contexts where a lot of information has to be presented while leaving time for group discussion.

As well, the visual nature of the method is likely to keep audiences more engaged. While Powerpoints tend to get mired in bullet points and large amounts of text, each slide in a PechaKucha is meant to be more of a talking point or a visual stimulus for the speaker so as not to distract the audience from the information being imparted.

The one downside to the method also stems from its brevity: presenters are encouraged to prepare thoroughly before hand lest they be cut off when their slide changes mid-sentence.[5] However, if mastered, the PechaKucha can be a powerful tool for deliberative innovators.

Why use Pecha Kucha for internationalization projects?

The main goal for pupils from other countries is to engage them to have a conversation with pupils abroad about the similarities and differences between their own culture and those of other countries by means of Pecha Kucha. Pecha Kucha requires good presentational skills as well as good organizational skills. By doing this they practice using ICT skills which will be helpful in the future while having a professional career. By sharing their stories they practice with expressing themselves in English. They will practice with presenting their own world to other international pupils and they will become aware what image other European pupils have of their own country. After sharing their stories through Pecha Kucha they:

- are able to present actual topics of their own country.
- know about current issues that are important in other European countries. (environmental problems, state establishment, refugee policy, European cooperation, Trump, fake news, etc)
- are able to describe a historical event that has had a major impact on their country. (fall of the Berlin Wall, World War II, local heroes, etc)
- know how a historical event can have different consequences for countries.
- have practiced using their ICT skills by making a Pech Kecha for which they have to use PowerPoint.
- Have practiced with presentational and organizational skills.
- Have practiced expressing themselves in another language.

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Working with the Microbit

Microbit is a mini computer which can be used by anyone in a matter of minutes. Even with a minimal knowledge of programing, you can design and play a digital game rapidly. The Microbit is very suitable when it comes to introducing young children to the wonderful world of programing. At Mondial College, the students who go to our Tech department have had an opportunity to work with the Microbit. Other students have an opportunity to follow a course which will introduce them to the Microbit.

Learning how to work with it, is a 'learn as you go along' process. The students get a number of assignments which they can do at their own pace. Some learn faster than the others. Some students have certain advantages because they are already familiar with the programing, because they have been introduced to it at primary school, or at home. Some children have to learn from 'scratch', the others are already able to program an Arduino or Raspberry Pi. We, as teachers, distinguish three different levels: start, advanced and expert level. As already stated, the students are able to follow the course at their own pace. It is also possible for students to complete the process in a way which fits their own needs and interests.

Because our students are able to choose their own learning route we have decided to put a number of basic skills in 'map form', so the students can learn these at the required moment. Below you can see the example of a basic skill 'Measuring the magnetic field by using the Microbit'.

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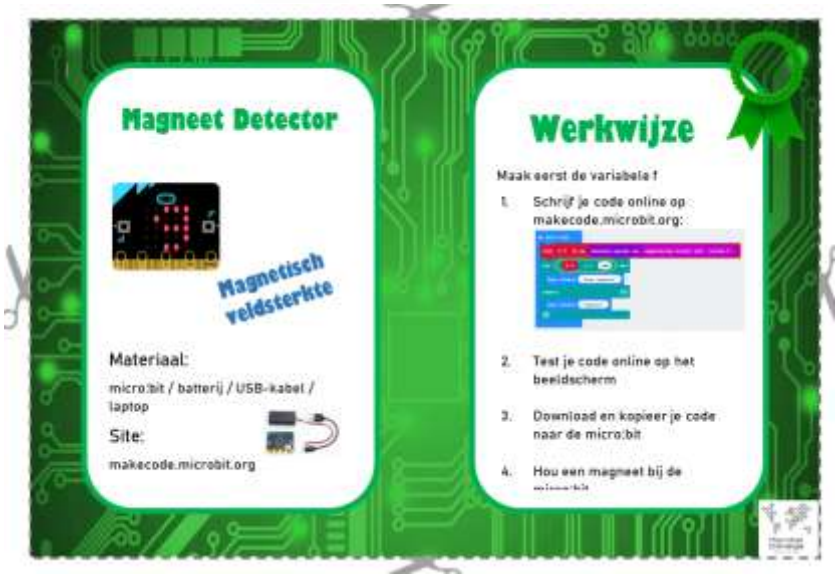

In this map the students can find certain requirements, the programing section and the test section. We are still working on developing multiple 'maps' at full speed.

We have been working on this for two years and our students, as well as our teachers, are very enthusiastic.