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21st Century Skills for 21st Century Needs

HANDBOOK OF METHODOLOGY AND TOOLS

Erasmus+ : KA2 – Cooperation for innovation and the exchange of good practice – Strategic partnerships for school education

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PART 1: METHODOLOGY - TEACHER TRAINING COURSE

The methodology

In order prepare the young people today for the challenges and realities of the 21st century, we need to address which skills and competences that are acquired and the position of soft skills in education.

In this project we developed a methodology in the form of a teacher training course.

The course will give teachers more knowledge on 21st Century skills and how this relates to existing pedagogy. In addition to the theoretical perspectives the teachers also learn new methods for teaching and are themselves part of creating pedagogical tools for teaching 21st century skills in schools today.

Soft skills and deep learning can be operationalized in different ways. The project "21st Century Skills for 21st Century Needs" have used the framework of Michael Fullan.

Six competences have a central position in this framework. These six C's are Character, Citizenship, Collaboration, Communication, Creativity and Critical thinking and problem solving. The skills are related to how you work and how you interact with other people. It means that they are non-technical skills and consequently difficult to measure. They are non the less essential skills for the 21st century.

The methodology of the course is also developed in light of the 6 C's. The outcome of the course is thus dependent on the use of the 6 C's both of the participants and the lecturers. Hence it is a dynamic process and will differ from course to course, depending on the actors in the course and the context.

The teacher training course

The teacher training course is structured into three courses. Each course have a duration of three days. In the project the three courses were held in three different countries and this opened up for different cultural contexts and frames, thus giving the international dimension to the course.

The three courses have a mixture of theoretical lectures, practical work, excursions and inputs from businesses and society. The 6 C's are particularly discussed in relation to interdisciplinarity and deep learning, because they are closely connected to this way of working.

After the first and second courses, the participants can carry out an intermission work to test the new theory and experiences. This allows for comparisons and discussions between the participants. The result of the intermission works in this project are structured and presented as a sample of case studies, which can be used as tool kits for teachers around Europe and world-wide.

An important part of the methodology in the course is the use of reflection as a method for developing new knowledge. All three courses therefore start and finish with reflection methods and all new theory is followed up by reflections in groups and in plenary sessions.

Pre-course questionnaire for participants

In order to develop and adapt the seminars to the participants of this course it is advised to perform a survey addressing the core ideas of the course and the pedagogical implementation of the 21st century skills.

1. With regards to your everyday teaching, describe the teaching methods and strategies you emphasize on in teaching students (in general).

2. Are there any areas in teaching (methods and strategies) you would like to use more or develop further?

3. What types of learning environments do you usually use in your everyday teaching?

4. The ERASMUS project is a project on the 21st Century Skills. The core skills are critical thinking and problem solving, communication, creativity, collaboration, character and citizenship.

    a. In overall, what are your thoughts about these skills?

    b. Are these skills something that you are aware of or emphasize on developing in your everyday teaching?

    c. Pedagogical implementation of 21st century skills. How do you teach 21st century skills/how do you think you should teach 21st century skills/how are the 21st century skills part of current teaching?

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COURSE 1

INTRODUCTION TO 21ST CENTURY SKILLS

Course 1 introduces 21st Century Skills and the 6 C's of Michael Fullan. The first course also focuses on establishing a good learning environment, so that the participants will be motivated to share thoughts and experiences, and cooperate across countries and schools.

WORKSHOP PLAN DAY 1

TEACHER TRAINING COURSE 1 – DAY 1		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
1,5 hours	Introduction to the course and introduction of participants	What Introduction of the overall program for the whole course and the main theoretical and methodological framework. Personal introduction by each participant – background information, their main motivation for joining the course and their expectations of learning outcome. Why It is important to do a clarification of expectations at the beginning of the course. This will reduce misunderstandings during the course. Preparing the participants on the fact that the course will not necessarily provide clear and absolute answers and solutions, will make them more resilient in the learning processes.
0,5 hour	Ice-breaking activity	What Teams of 5-6 people. Marshmallow tower challenge. Equipment: spaghetti straws and marshmallows. The challenge is to build the tallest standing tower in 15 minutes. Plenary summary afterwards with an award to the winning team.

		<u>Why</u> Icebreaking activities break down barriers that usually exist between participants who do not know each other. They make it easier to communicate with one another. This icebreaking activity also gives the participants the opportunity to use several C's in working on the challenge.
1,5 hours	Getting to know each other's local community using Venn-diagram	<u>What</u> The participants are divided into groups of 5-6. The groups can be the same throughout the whole course. Each group gets a sheet of paper with overlapping circles. Each circle represents a local community/country. Together they write down what is characteristic for their local community/country and what is overlapping with one or more of the other countries/local communities. The same task is done for school systems – what is different, what is overlapping? This is a working method which can be used on many different subjects and in different settings. <u>Why</u> To have a certain knowledge of differences and similarities between the countries/local communities and their working context as teachers is important to be able to work with different issues and tasks in group works later in the course.

1 hour	Presentation	<u>What</u> Group presentations of diagrams in a plenary session. <u>Why</u> To see how the different groups have made their circles and what they consider to be overlapping can give new ideas and understandings. It is also interesting to see how the different groups have interpreted the task.
0,5 hour	Check out	<u>What</u> This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass on the word to the next participant. <u>Why</u> To consolidate new knowledge and give the participants room to put the academic content into context
3-4 hours	Dinner: make your own dinner	<u>What</u> The participants gathered for dinner in the evening. They were divided into several groups, with a country mix, and given different tasks: Group 1 – Starter Group 2 – Main course Group 3 – Dessert Group 4 – Decoration of the dining room

		Group 5 – Entertainment To complete the tasks, the group had to use at least three of the 6 C's. Why This was done to make the participants get to know each other better, on a more informal arena. It was also an opportunity to work with the 6 C's and get to know the C's in practice while working on the relations with the fellow participants on the course.

WORKSHOP PLAN DAY 2

TEACHER TRAINING COURSE 1 – DAY 2		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What A short recap of the learning outcome of the previous day. Framing in today's program. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.

0,5 hour	Ice-breaking activity	What Groups of 5-6 participants. Paper tower challenge. The teams are given the same building items – paper and cellotape. They are also given a Kinder egg. In 15 minutes, they are going to build the tallest free-standing structure that can support the weight of the Kinder egg. Why Icebreaking activities break down barriers that usually exist between participants who do not know each other. They make it easier to communicate with one another. This icebreaking activity also gives the participants the opportunity to use several C's in working on the challenge.
1,5 hours	Introduction to the 21st century skills Historic perspective of the 21st century skills Fullan's 6 Cs	What This program post starts with a lecture on 21st century skills and the historic perspective of the skills. Following up on these lectures is an introduction to Michael Fullan's 6 Cs as the theoretical framework for this course. Here the content behind each C is concretized. Why It is important to have a certain common theoretical platform as a basis before entering into group work.

1,5 hours	Group work: The content and operationalization of the 6Cs	<u>What</u> Groups of 5-6 participants. Operationalization of the 6C through discussions. A handout with the 6 Cs is used as a basis for discussion. Cards with several other soft skills are handed out, which can be sorted under each of the 6 C. Six hats represents the 6 Cs. The groups will discuss which C the skill belongs to and put them in the relevant hat. This exercise can also be done using the categories “cognitive”, “interpersonal” and “intrapersonal” before using the categories of the 6 Cs. <u>Why</u> Although the 6C is a word for C, which directly implies a content, it can be difficult to see what they can imply for the students in school. There is therefore a need to concretize the content behind each C. This is best done through discussions in groups to open up for a broader view and different perspectives.
1,5 hours	Film: “Most likely to succeed” https://teddintersmith.com/mltsfilm/	<u>What</u> A thought-provoking documentary feature film that reveals the growing shortcomings of conventional education methods in today's innovative world. It is a film that inspires, provokes and engages.

		Why To use a film as a provocative tool is effective for creating good reflections and discussions.
1,5 hours	Reflections and discussions based on the film “Most likely to succeed”.	What Groups of 5-6 participants. This session is about creating relevance and seeing transfer value. Here, reflection and discussion will be a good way to open up to see relevance and transfer value for each participant. Equipment: Dialogue cards/discussion cards with key words og questions. Why The film shows a number of exciting themes, and it is important to find the transfer value in both mindset, activities and methodology towards one's own practice/own country's practice.
0,5 hour	Check out	What This is a session for summing up the day and do reflections on the participants’ learning experiences. A “reflection ball” can be used to pass on the word to the next participant. Why To consolidate new knowledge and give the participants room to put the academic content into context.

WORKSHOP PLAN DAY 3

TEACHER TRAINING COURSE 1 – DAY 3		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What A short recap of the learning outcome of the previous day. Framing in today's program. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
0,5 hour	Icebreaking activity	What The one-word icebreaker game. Teams of 5-6 participants. Ask them a very simple question—e.g., "What one word do you associate with entrepreneurship?" Give each team five minutes to come up with their answers. Before finalizing their one word, teams will have rigorous discussions among themselves. Then it's time to ask each team to share their answers with the rest of the group—facilitating even more discussion.

		<u>Why</u> Icebreaking activities break down barriers. They make it easier to communicate with one another. This icebreaking activity also gives the participants the opportunity to dive into a theoretical question in a creative way.
2 hours	Entrepreneurship: a narrow and wide concept Group work: study a mathematical example. Is this entrepreneurship?	<u>What</u> A lecture on entrepreneurship and the different ways of understanding the term, and how this can lead to different ways of practicing entrepreneurship. Short discussions under way. The groups get to try different practical tasks with learning goals in mathematics. they are encouraged to see this in relation to the idea of entrepreneurship. <u>Why</u> The purpose of this section is to see the benefits of working with entrepreneurial learning. Through these examples the participants can see the many possibilities for smaller and larger teaching arrangements where entrepreneurship is involved.
1,5 hours	Visit from the local community: - Private company - Public sector	<u>What</u> One private company and one organization from the public sector give a lecture on their view of the skills for the future and how schools and the local community can cooperate.

		<u>Why</u> This session has a two-part purpose. One is to see the opportunity that lies in connecting education to the local society. This is something that most education systems are concerned with, to ensure that training is not something that happens as a laboratory experiment within the walls of the school, released from the local environment the school is located in. The second purpose is to take the temperature on if the work done in training/education means that those who enter working life have the right skills. There are several surveys today showing that while universities and colleges largely experience qualifying their students for working life, leaders in working life say that while most candidates have good academic qualifications, they lack some of the necessary skills required in today's working life. This session can thus function as a "wake up call" in relation to which skills the working life sees as important in future employees. The education system can then reflect upon whether this corresponds to the activities, learning journeys and skills that the education system stimulates.
2 hours	Intermission work: "Teaching the 6 Cs"	<u>What</u> The groups collaborated to create interdisciplinary teaching programs that involved collaboration with 'one or several local institutions' and where some of the 6C were included. The groups were to end up with a plan for a teaching program that could be implemented with certain similarities in the different countries.

		<u>Why</u> The purpose of intermission work is to ensure that the learning processes are connected. It provides an opportunity to try out theory and create new practice based on this. In other words, to ensure that theory is translated into practice. Intermission work is a useful tool in this respect.
0,5 hour	Check out	<u>What</u> This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass the word on between the participant. <u>Why</u> To consolidate new knowledge and give the participants room to put the academic content into context.

COURSE 2

LEARNING PROCESSES AND DEEP LEARNING

Course 2 gives a theoretical framework of learning processes and on deep learning. The theory is supplemented by practical examples and group sessions.

WORKSHOP PLAN DAY 1

TEACHER TRAINING COURSE 2 - DAY 1		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What Framing in today's program. Further "check in" is done in the "summary" section. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
0,5 hour	Icebreaking activity	What Human rock-paper-scissors. Teams of 5-6 participants. Let each team come up with particular body signals for each move. Have each team face off in a best-of-five series and see who wins the tournament. Why Icebreaking activities break down barriers that usually exist between participants who do not know each other. They can bring a kick start to a seminar or a working session.

		This icebreaking activity also gives the participants the opportunity to use several C's in working on the challenge.
0,5 hour	Summary from the last seminar -What did we do and learn in the previous seminar? - What have we done since the previous seminar? -What were the results?	<u>What</u> Go through the main learning points from the previous seminar. Connect these points to the intermission work done between seminar 1 and 2 and do a brief discussion on the results. <u>Why</u> To reactivate the learning from the previous seminar it is useful to go back and look at the learning points. It is also a way to raise awareness on how the previous learning has been tried out through the intermission work and how this has created new knowledge in the participants.
1,5 hours	Group work on the intermission work	<u>What</u> The intermission groups first get to exchange experiences from their testing of the teaching plan. Then they get to discuss their experiences in light of the six Cs. The groups prepare a common presentation of their experiences and learning. The presentation should focus on the 6 Cs. <u>Why</u> To have a joint discussion and reflection in the groups on how the teaching program worked in the different countries, and how it affected the learning of soft skills, can create new knowledge and new learning. This is an important part of the learning process in this project.

1,5 hours	Presentation of intermission work	What A 10-minute presentation by each group. After each presentation there is a 5-minute session for questions and reflections from the other groups. Why This session is to get feedback and reflections from the other groups and to get new ideas and inspiration from listening to the others.
1,5 hours	What have we learned about working with the 6C?	What A plenary discussion on the presentations and experiences from the intermission work. The focus of the discussion is on the 6 Cs. Why This session helps to concretize and establish the competence of the 6C further. It can also contribute to deeper reflections which will take the participants further on their learning journey.
0,5 hour	Check out	What This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass the word on between the participant. Why To consolidate new knowledge and give the participants room to put the academic content into context.

WORKSHOP PLAN DAY 2

TEACHER TRAINING COURSE 2 – DAY 2		
TIME ESTIMATE (HOURS)	**PROGRAM**	**READ MORE**
0,5 hour	Check in	What A short recap of the learning outcome of the previous day. Framing in today's program. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
3 hours	How do we know that students learn?	What This is a lecture, with group work included, to highlight research and theories about what can benefit students' learning. The different themes are linked to different parts of the film shown in seminar 1 (Most likely to succeed). The film thus forms a common foundation in the discussions so new ideas and tools that can be used in teaching. Why Link different parts of the course by watching films and previous activities in connection with theory and research.

2,5 hours	Visit from/to the local community Cooperation between schools and local society.	<u>What</u> This session can include both a visit from the local community and a field trip to a business or organisation in the local community. Both alternatives must be practical examples on how schools and actors within the local community cooperates. <u>Why</u> The purpose of this session is to see the opportunities that lie in connecting education to the local community.
1 hour	The 6 Cs in the cooperation between schools and local society.	<u>What</u> A 15-minute discussion in the groups on how the 6 Cs could be used in the examples from the previous session – how were the different Cs relevant in each of the examples. This is then discussed in a plenary session (45 minutes). <u>Why</u> This session helps operationalize and establish further awareness and expertise on the 6Cs. To reflect upon theory through a practical example creates new and deeper learning.
0,5 hour	Check out	<u>What</u> This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass the word on between the participant.

		Why To consolidate new knowledge and give the participants room to put the academic content into context.

WORKSHOP PLAN DAY 2

TEACHER TRAINING COURSE 2 – DAY 3		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What A short recap of the learning outcome of the previous day. Framing in today's program. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
0,5 hour	Icebreaking activities	What Whodunit Groups of 5-6 participants. Each person writes down something interesting they've done on a note card (e.g., skydiving, have lived in 10 different states, drank a gallon of milk in five minutes—the sillier the better).

		Put the note cards into a hat, give it a nice shake, and have each person draw a note card they will then read aloud. The reader must then try to guess "whodunit" and why they came to that conclusion. <u>Why</u> Icebreaking activities can bring a kick start to a seminar or a working session, giving the next session ine the program even more positive energy. This icebreaking activity also gives the participants the opportunity to use several C's in working on the challenge.
3 hours	Defining and Understanding "Deep Learning".	<u>What</u> A lecture on "Deep Learning" and how to implement the skills and deep learning in disciplines using the local community. The lecture is followed by a group work assignment. <u>Why</u> The purpose of this session is to gain more knowledge on "deep learning" see this in relation to interdisciplinarity and the 6C, thus making theory either applicable or effective for the field of practice.
3 hours	Intermission work	<u>What</u> Groups of 5-6. The groups get one C each. They start by discussing the C, and how they can work with this in school. Then they discuss teaching programs that can promote the development of this C.

		<u>Why</u> The intermission work allows the participants to operationalize and establish expanded competence within a certain C. The working method can hopefully contribute to the participants seizing the opportunity to work in the same way with another C later. The intermission work provides an opportunity to try out the new theory presented in seminar 2 and create new practice based on this.
0,5 hour	Check out	<u>What</u> This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass the word on between the participant. <u>Why</u> To consolidate new knowledge and give the participants room to put the academic content into context.

COURSE 3

THE 21ST CENTURY SKILLS IN PRACTICE

Course 3 converts theory into practice and makes the participants reflect on the practice in light of the theoretical framework of the two first courses. This last course also makes the participants plan for their future work with 21st century skills and how to be changemakers in their own teaching institutions.

WORKSHOP PLAN DAY 1

TEACHER TRAINING COURSE 3 – DAY 1		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What A short recap of the learning outcome of the previous seminars. Framing in today's program in that context. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
0,5 hour	Icebreaking activity	What Group of 5-6 participants. Charades Charades is all about acting. The goal is to describe an object, movie, book, or a person using just your acting skills. Have one person to pick the word. That person will then pick one individual from the group and whisper the word in their ear (or write it down on a piece of paper). That individual will then have to act out/do something that would hint at the word, as others attempt to guess the correct answer. Take turns and start over again when everyone has acted out a word once.

		<u>Why</u> Icebreaking activities break can bring a kick start to a seminar or a working session and break the ice. This can be useful when the participants have not seen each other for several months. It is also an opportunity to use several C's in working on the challenge.
2 hours	Presentations of intermission work	<u>What</u> The intermission groups first get to exchange experiences from their testing of the teaching plan. The groups prepare a common presentation of their experiences and learning with their given C. <u>Why</u> To have a joint discussion and reflection in the groups on how the teaching program worked in the different countries can create new knowledge and new learning. This is an important part of the learning process in this project.
1 hour	Discussion of intermission work and 6Cs	<u>What</u> A plenary discussion on the presentations and experiences from the intermission work. The focus of the discussion is on the 6 Cs. <u>Why</u> This session helps to concretize and establish the competence of the 6C further. It can also contribute to deeper reflections which will take the participants further on their learning journey.

1 hour	"Talk show" Business leader, public sector leader and a teacher/principle	What A "talk show" with 3 participants in the panel: A business leader, a leader for an organization in the public sector and a teacher with experience in working with entrepreneurship. Why The purpose of this session is to have the working life's perspectives on skills for the future and whether those who enter working life today have the skills needed.
1 hour	Reflection and questions	What Plenary session where the participants can ask questions to the "talk show" panel or do reflections based on the cases discussed during the "talk show". Why The purpose is to allow for the teachers to engage in the discussion with the knowledge and experience they have gained so far in the seminars, thus potentially creating new knowledge. It is interesting to explore if the views and mind sets have changed from the first seminar to the last.
0,5 hour	Check out	What This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass the word on between the participant. Why To consolidate new knowledge and give the participants room to put the academic content into context.

WORKSHOP PLAN DAY 2

TEACHER TRAINING COURSE 3 – DAY 2		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What A short recap of the learning outcome of the previous day. Framing in today's program. Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
0,5	Icebreaking activity	What Group of 5-6 participants. Elephant, Giraffe and Palm Tree. Form a circle with one person in the middle. The middle person points to an individual and the person pointed to along with the persons on each side will have to form what was called out. The three choices are Elephant, Giraffe and Palm Tree Elephant – the middle person (one pointed to) will form an elephant trunk by putting arms straight in front with arms crossed at the wrists. Persons on each side will form the ears of the elephant by facing forward but bending towards the middle person, cupping around their mouth with their hands as if whispering to the middle person.

		Giraffe – person pointed to raises arms over head, arms extended, and fingers closed pointing forward. While bending over, side people grab the middle one's waist. Palm Tree – the person pointed to raises arms above their head in a "Y" formation, fingers open. Side people do the same but lean toward the outside, away from the middle person. The object of the game is to try to keep changing the formations required. This game is to be played quickly. As soon as an object is formed, the person in the middle of the circle must point to someone else. <u>Why</u> Icebreaking activities break can bring a kick start to a seminar or a working session and break the ice. This can be useful when the participants have not seen each other for several months. It is also an opportunity to use several C's in working on the challenge.
1,5 hours	Youth Business	<u>What</u> A presentation from one or more youth businesses. In Youth Business, students in upper secondary education gain experience in establishing, running and winding up their own youth businesses through one school year. Youth business is run within the school and in collaboration with the teacher. By working with Youth Business, the students build skills that are in demand by the working life. They develop competencies such as creativity, taking initiative, taking responsibility, collaborating, solving problems and translating ideas into action (implementation ability). In this session the students present their company and their experiences throughout the learning process.

		Why This session is to show the participants a practical example of one way to work with skills and to allow for the voice of the students and their view on working with skills in their education.
2,5 hours	Visit from/to the local community Cooperation between schools and local society.	What This session can include both a visit from the local community and a field trip to a business or organisation in the local community. Both alternatives must be practical examples on how schools and actors within the local community cooperates. Why The purpose of this session is to see the opportunities that lie in connecting education to the local community.
1,5 hours	Dialogue cards – 6 Cs	What The groups are dealt two sets of cards. Each set of cards contains six cards, one card for each of the 6C. The groups will discuss and agree to put the 6Cs in order. They should create an order in which they rank the 6C from most important to least important, and an order in which they rank the 6C from easiest to implement in teaching to most difficult to implement.

		Why Operationalize and establish an expanded competence of the 6C, and how it can be worked with them in school.
0,5 hour	Check out	What This is a session for summing up the day and do reflections on the participants' learning experiences. A "reflection ball" can be used to pass the word on between the participant. Why To consolidate new knowledge and give the participants room to put the academic content into context.

WORKSHOP PLAN DAY 3

TEACHER TRAINING COURSE 3 – DAY 3		
TIME ESTIMATE (HOURS)	**PROGRAM**	**WHAT AND WHY**
0,5 hour	Check in	What A short recap of the learning outcome of the previous day. Framing in today's program.

		Why To bring the minds back into the learning environment and to activate the participants' prior knowledge on skills.
0,5 hour	Icebreaking activities	What Portrait gallery. This ice breaker activity is a fun one that requires some creativity. The outcome is very visual and colourful, the images can be put up in the conference room. Step 1: Split the group into two equal halves, called group A and group B. Group A forms an inner circle facing outward; group B forms an outer circle facing inward. Each person in group A should be facing one person in group B. Step 2: Members of Group A, the inner circle, are the subjects of the portraits. Group B are the artists. Explain that group B will be the portrait artists for group A. Every member of group B should have paper and marker in hand and begin by writing the name of their subject at the top of the paper. There should be many different colours of markers and they should be as thick as possible. Step 3: When the activity begins, the artists in group B begin drawing the subjects in Group A. They do so in 10-15 second intervals. After each interval, the leader calls “Rotate!” and the artists rotate one step to the left while handing their paper to the person to their right. Thus, each

		artist is standing in front of a new subject with that subject's portrait in his/her hands. When they rotate, the artists must keep their markers. Step 4: Rotate at 10-15 second intervals until the artists in Group B have rotated all the way around. By this point, each portrait should quite developed (and quite messy). When the artists arrive back at their original subject, the rotation ends, and they may hand back the portrait to that person. Step 5: Switch the groups and repeat. The artists become the subjects and vice versa. With an uneven number of participants, a facilitator must step in as an "extra". <u>Why</u> Icebreaking activities can bring a kick start to a seminar or a working session. This particular activity can be a nice icebreaker for the last seminar, leaving a memorable visual result.
2 hours	Working with socio-scientific questions	<u>What</u> The groups are presented with one or two cases/dialogue tasks where it is difficult to agree on a solution or a correct answer. Examples of such dialogue tasks are stories where all actors make choices that can be criticized, but where at the same time it is difficult to appoint someone who is responsible. In such tasks, the group can rank guilt and innocence. Real socio-scientific issues can also be discussed, such as the predator debate. For example, the groups can discuss predator protection versus exploitation of natural pastures, or they can rank from most important to least important who has the most right to stay in the forest and

		mountains. They are also given a series of cards with pictures of predators, grazing animals and humans. <u>Why</u> The purpose of this session is to show examples on how to work with questions without a single answer. Hopefully the participants see the opportunities to create such dialogue assignments for students.
3 hours	Bringing new knowledge into the future	<u>What</u> A session of individual and group work x 3, and a plenary session. Using the digital tool Menti, the following question is put up on the screen – "Within your school system – what are your possibilities and options as a teacher to have more focus on the soft skills?". 5-minute individual work on the question and 15 minutes group discussion. The same is done for a second question – "Within your school system – what are your possibilities and options as a teacher to involve local businesses and society even more in your teaching?". 5-minute individual work and 15 minutes group work. The third question is "If you could set the framework of tomorrow's education system – what would be your focus areas?" For the third question the groups are asked to illustrate or dramatize their conclusions. 5-minute individual work and 15 minutes group discussion. 15 minutes to plan presentation and 30 minutes for plenary presentations. Using Menti the groups can add their discussion points onto the platform and the results are shown on the screen.

		Following the group work is a 40-minute plenary discussion and reflection based on the group work – with the Menti results up on the screen. The last 20 minutes the participants individually answer one question in Menti - "What is the first change you will make when you come home?" and then discuss the results in a plenary session. Why The purpose of this session is to get the participants to reflect on their learning process and what they will take with them from this course. It is also to make them think ahead on how to take their learning back to their workplace.
0,5 hour	Summary of the seminars	What Summing up the learning journey from the first seminar to the last. Linking this to the comments made by the teachers in the previous session, on how they plan to take this further in their own teaching institution. Why To encourage the participant to continue their work and develop their teaching of skills further.

READING LIST AND TEACHING MATERIAL

In this section the teaching material for the teacher training course is presented. The teaching material is structured by course number and day.

Reading list

Books and articles:

Askew, M. (2000). It ain`t (just) what you do: effective teaching? In I. Thompson (Ed.), Issues in teaching numeracy in primary schools: Open University Press.

Beames, S., Higgins, P., & Nicol, R. (2011). Learning outside the Classroom: Theory and Guidelines for Practice: Routledge, Taylor & Francis Group.

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Belenky, D. M., & Schalk, L. (2014). The Effects of Idealized and Grounded Materials on Learning, Transfer, and Interest: An Organizing Framework for Categorizing External Knowledge Representations. Educational Psychology Review, 26(1), 27-50. doi:10.1007/s10648-014-9251-9

Dewey, J. (1966). Democracy and education. New York: The Macmillan Company / The Free Press.

Dewey, J., & Dewey, E. (1915). Schools of tomorrow. London: Dent & Sons.

Fiskum, T. A. (2015). Outdoor education as an alternative and complementary pedagogy: acknowledging the nature of children. (2015:26), Norwegian University of Science and Technology, Faculty of Social Sciences and Technology Management, Department of Social Work and Health Science, Trondheim.

Fiskum, T. A., & Jacobsen, K. (2012). Outdoor education gives fewer demands for action regulation and an increased variability of affordances. Journal of Adventure Education & Outdoor Learning, 1-24. doi:10.1080/14729679.2012.702532

Fullan, M., Quinn, J. & McEachen, J. (2018). Deep Learning: Engage the World Change the World. California: Corwin, a SAGE Publications Inc.

Fyfe, E. R., McNeil, N. M., Son, J. Y., & Goldstone, R. L. (2014). Concreteness Fading in Mathematics and Science Instruction: aSystematic Review. Educational Psychology Review, 26(1), 9-25. doi:10.1007/s10648-014-9249-3

Glassco S., Fosnot V. T., *The Architects' Project,*2014, ISBN: 1484025393

National Research Council (2012). Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century. Washington, DC: The National Academies Press. https://doi.org/10.17226/13398.

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Vogel, S., Herron, C., Cole, S. P., & York, H. (2011). Effectiveness of a Guided Inductive versus a Deductive Approach on the Learning of Grammar in the Intermediate-Level College French Classroom. Foreign Language Annals, 44(2), 353-380.

TEACHING MATERIAL COURSE 1 DAY 1

- Lecture slides day 1
- The 6 C's of Michael Fullan

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Course 1 – Day 1

Getting to know each other

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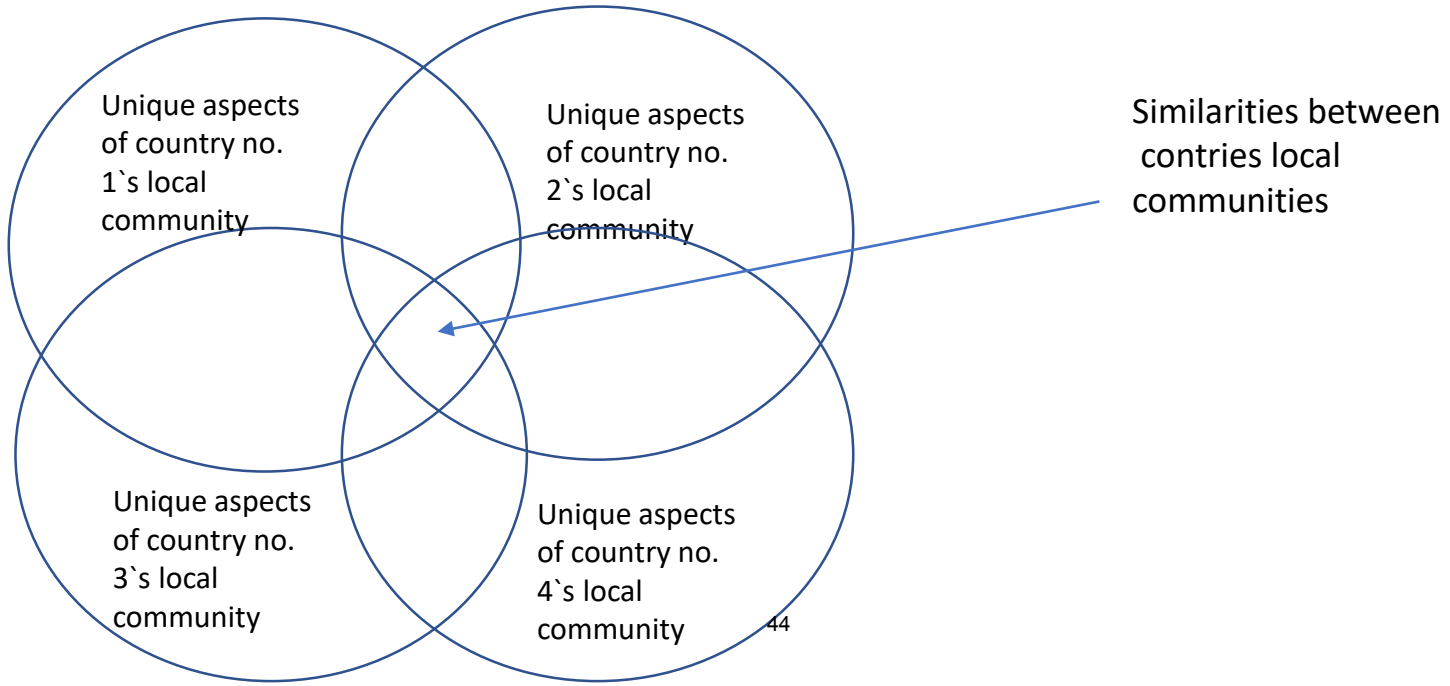
1. Group work assignment

- Contrasting localities- differences and similarities in your local communities

- Work in groups
- Using a Venn-diagram, write down your differences and similarities in your respective local communities.
- Compare your differences and similarities in your respective local communities.



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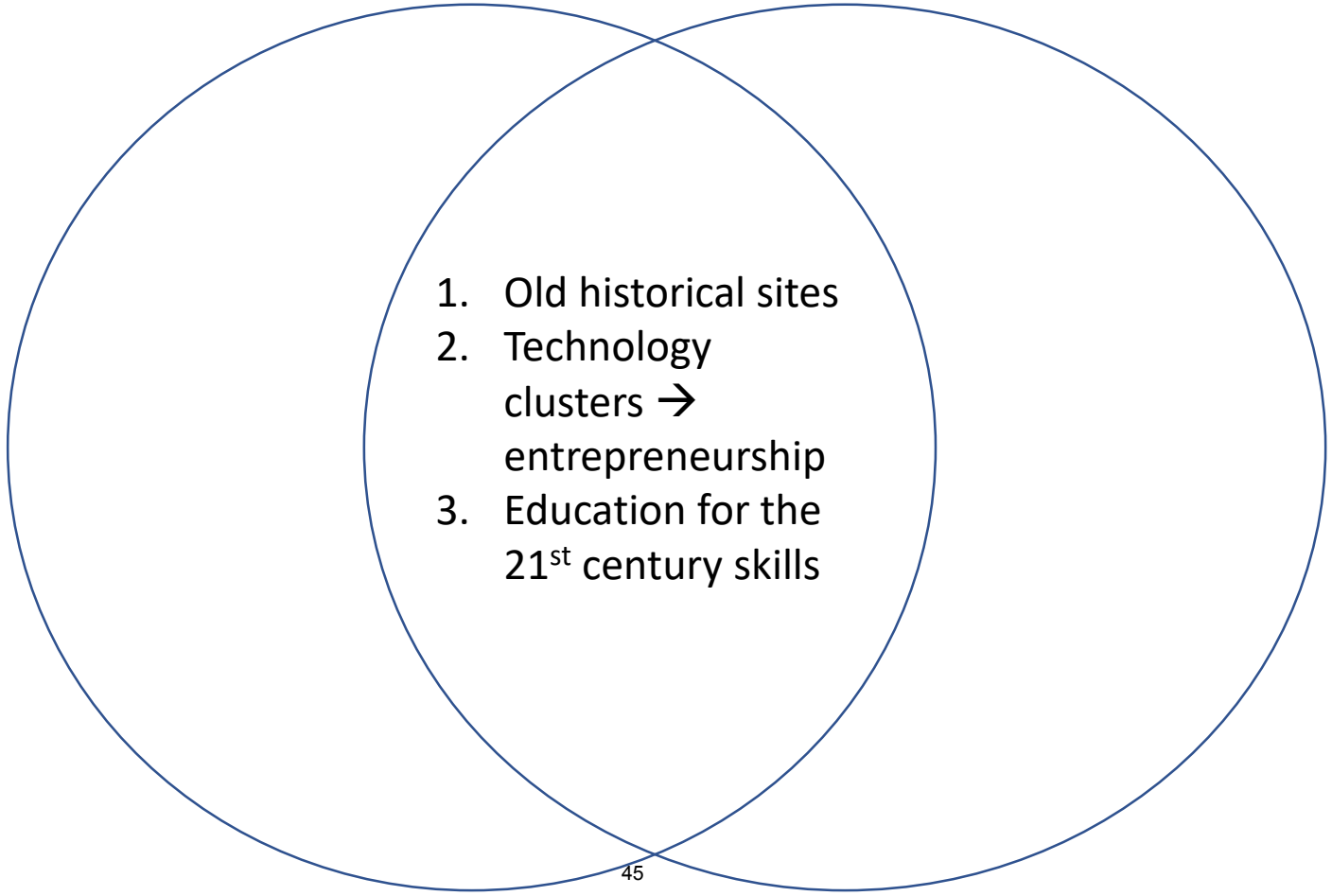
Comparing contrasting localities: Verdal vs.Cambridge



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Stiklestad
A National Memorial

Old medieval stone church completed in 1180

The church was built at the site of the Battle of Stiklestad. The church building is assumed to have been erected on the exact spot where St. Olaf was killed during that battle

The site is accordingly associated with the introduction of Christianity in Norway

Much cultural activity related to the history → Nord university has a study for Theater and Acting in Verdal

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Stiklestadir

A copy of a Viking Longhouse

Nearby is also a copy of a medivial farm and guest house

The buildings have many functions: Exhibition, teaching and different arrangements

The buildings are important parts of Stiklestad Nasjonale Kultursenter, a national museum. Almost all school classes in the region visit this museum. It has a large variety of teaching activities that combine history and practical subjects

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Gamme - *gåetie*: A traditional South Sami house (turf hut)

Nord University has a particular responsibility for education in South Sami language and culture

Sami culture has got a prominent position in the national curriculum

This house was newly opened on our campus

It will be a valuable teaching resource

There is an increasing interest for outdoor tourism in North Scandinavia

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An important agricultural district

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Kværner Verdal

Kværner Verdal is a construction yard for large steel constructions and substructures for offshore oil platforms.

It is the most important company in Verdal with more than 700 workers

Many support companies are located nearby → a **cluster** of firms in technology and knowledge economy

Altogether 240 firms are located in the cluster called Verdal Næringspark

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Newton Verdal

- It is a part of MNRT – a centre for technology and science in the Mid-Norway region
- The Newton concept is developed by the foundation FIRST Scandinavia, together with teachers, academic institutions and industry partners
- Kværner Verdal and Verdal municipality are central partners
- A Newton room is a state-of-the art science room where students can do hands-on experiments and practical activities

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Extractive industries in Verdal

Limestone quarris → export of chalk

Non-renewable resource

Timber at InnTre sawmill

Renewable resource → biogas

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Winter sport in near-by Åre, Sweden

- Winter sport is popular in Scandinavia
- An increasing interest for winter activities among Europeans
- However: They are threatened by global climate change

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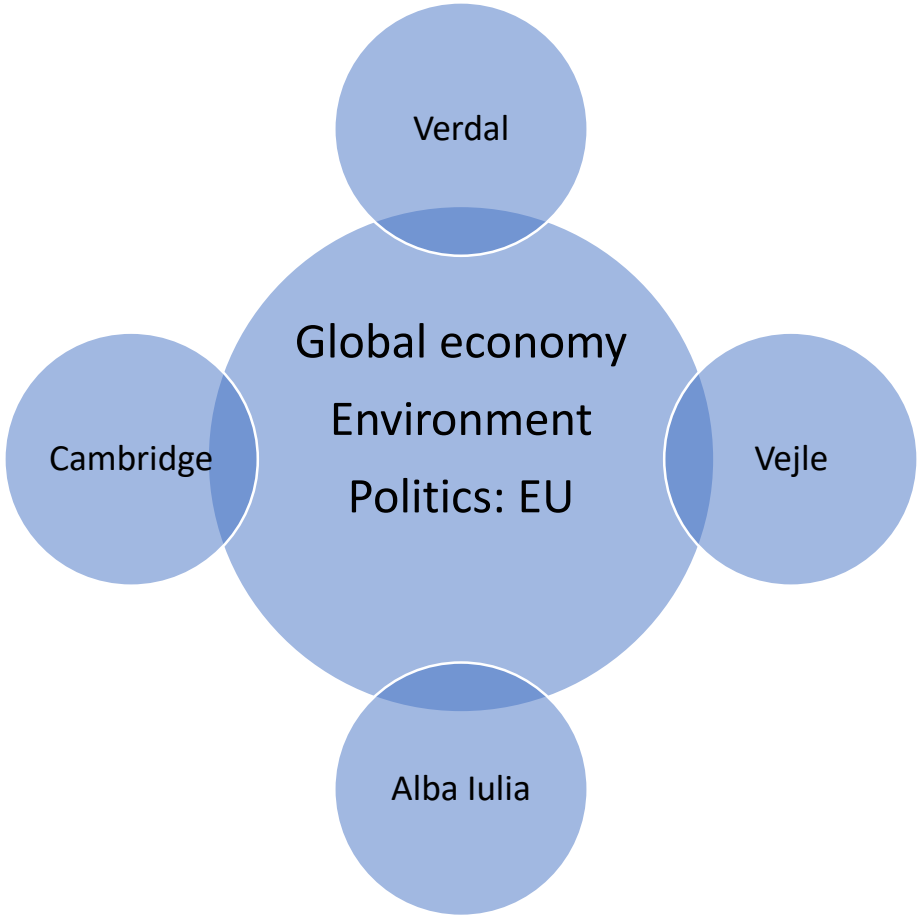
Connections in an interdependent world

- Which connections are there between our four places?
- Commercial connections
- Cooperations
- Some common challenges:
  - "Survival" in a competitive global economy
  - Global climate change → More sustainable development
  - Education for 21st century skills



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1. Group work assignment

- Contrasting localities- differences and similarities in your local communities

- Work in groups (group compositions given by Young Enterprise Mid-Norway and Form the Future).
- Using a Venn-diagram, write down your differences and similarities in your respective local communities.
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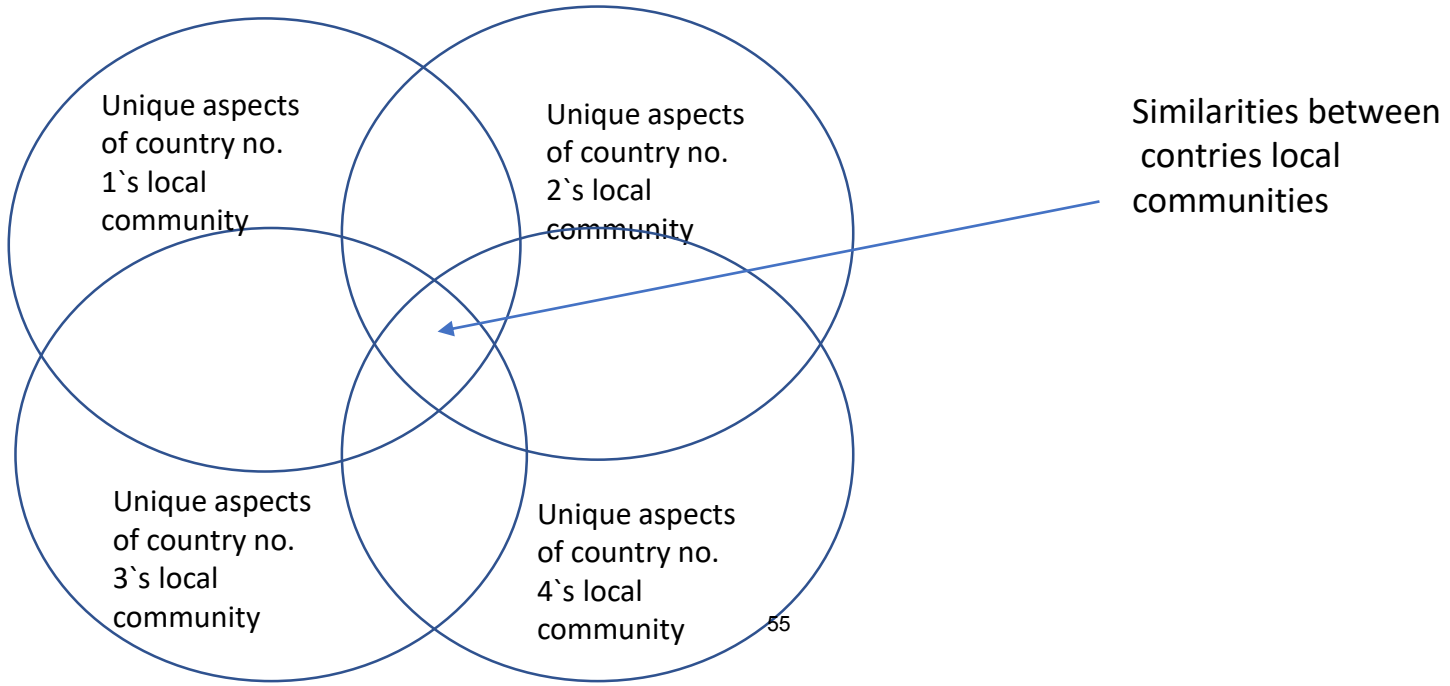

The 6 global competencies

Some examples based on Michael Fullan*:

Character:
- Learning to learn, and ability to regulate your own process of learning
- Ability to say 'no', and claim your own values
- Work goal-directed
- Endurance
- Resistant, endurance
- Self-regulated in work and social behaviour

Citizenship:
- Thinking as global citizens
- To explore global problem (using deep understanding and different values and worldviews)
- Genuine interests and abilities to solve complex real world problems which affects sustainability
- Empathy and ability to care for others

Collaboration:
- To cooperate in teams
- Interpersonal abilities and team-related abilities
- Social, emotional and intercultural abilities
- To learn from others and contribute to other people's learning

Communication:
- Ability to communicate in a purposeful way using a variability of methods
- Ability to communicate with digital tools
- Ability to adapt the communication to different groups
- Ability to reflect upon and impose better communication

Creativity
- To have an "entrepreneurship" within the possibilities you are given
- To make relevant and exploring questions
- To consider and follow-up new ideas and solutions
- Ability to do something with your ideas

Critical thinking
- Ability to evaluate information and arguments
- Ability to see connections and patterns
- Ability to solve problems
- Ability to make meaningful knowledge
- Ability to explore, reflect upon and follow up ideas in real life

* Fullan, M., Quinn, J. & McEachen, J. (2018). Deep Learning: Engage the World Change the World. California: Corwin, a SAGE Publications Inc.
* https://www.michaelfullan.ca/wp-content/uploads/2014/09/Education-Plus-A-Whitepaper-July-2014-1.pdf

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TEACHING MATERIAL COURSE 1 DAY 2

- Lecture slides day 2
- Skills cards
- Venn diagram

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Course 1 – Day 2

Getting to know the 6 Cs

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Why 21st Century skills?

Picture: vulture.com

Picture: mybroadband.co.za

How do you think the world will look like in 30 years time?

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Why 21st century skills?

- The world is facing unpredictable economic, social and environmental challenges.

How to prepare students for a world that doesn't yet exist?

- Education should prepare students for the demand of the society, different roles as adults such as citizens, employees, managers, parents, volunteers and entrepreneurs.

Environmental challenges

Economic challenges

Social challenges

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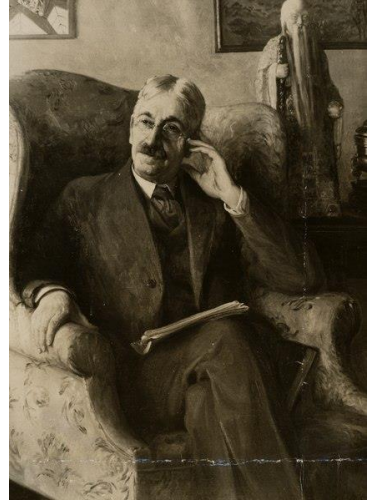
«The schools of tomorrow has to take a new direction»

Someone once said schools systems need to be:

- more connected to student activity, for example more use of our senses
- more concrete
- see the education as a whole (practical and theoretical tasks are related)
- less abstract and book-based knowledge
- the children and youngsters should be less divided from the adults life and work than today

When and who do you think stated this claims?

«The schools of tomorrow has to take a new direction»



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- see the education as a whole (practical and theoretical tasks are related)
- less abstract and book-based knowledge
- the children and youngsters should be less divided from the adults life and work than today

When and who do you think stated this claims?

This was stated in the book «Schools of tomorrow» by the pedagogic Dewey and is daughter Evelyn more than 100 years ago (Dewey and Dewey, 1915, Dewey, 1966)

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Historic thinking on 21st century skills

Before

- John and Evelyn Dewey (1915); «Schools of tomorrow»

Today:

- traditional schools are not experienced as engaging
- traditional schools are experienced as less relevant and the role of education is less certain
- students feel hopelessness, difficulty finding direction and one's role in the world and anxiety for an unpredictable future (Fullan, Quinn & McEachen, 2018)

Do we still have the same understanding of the education 100 years after Dewey?

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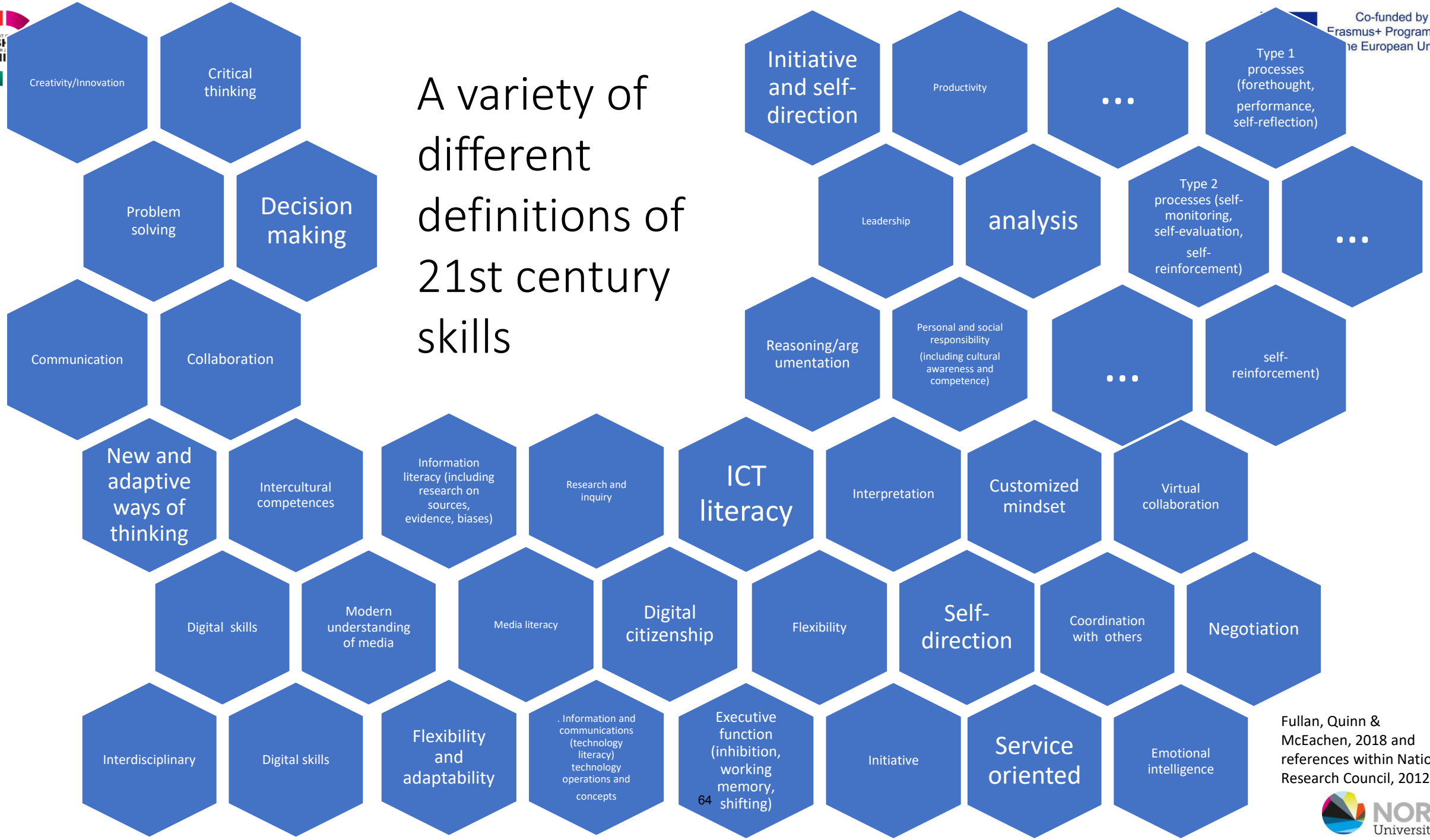
A variety of different definitions of 21st century skills



Fullan, Quinn & McEachen, 2018 and references within National Research Council, 2012.

NORD University

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Three broad domains of skills

References within National Research Council (2012).

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3. Group work assignment

- Placing skills into the three domains

- Work in groups
- Using the three hats and the different skills given; discuss the skills and place them in the appropriate «hats of domain»
- Discuss: Is it easy or difficult? Overlap between skills? Skills that are difficult to interpret the meaning of?

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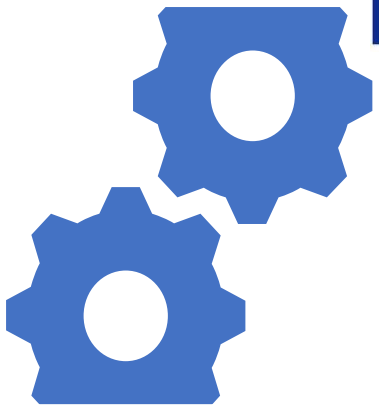
Michael Fullan`s
6 skills for the 21st Century
(Fullan, Quinn & McEachen, 2018)

Character

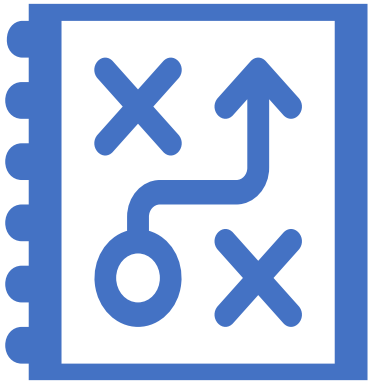
Citizenship



Collaboration

6 Cs of education

Communication



Creativity

Critical thinking

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4. Group work assignment

- Placing skills into the 6 Cs

- Work in groups
- Using six hats and the different skills given; discuss the skills and place the cards in the appropriate «hats of 6 Cs»
- Discuss: Is it easy or difficult? Overlap between skills? Skills that are difficult to interpret the meaning of?

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Developing transferable knowledge and skills in the 21st century

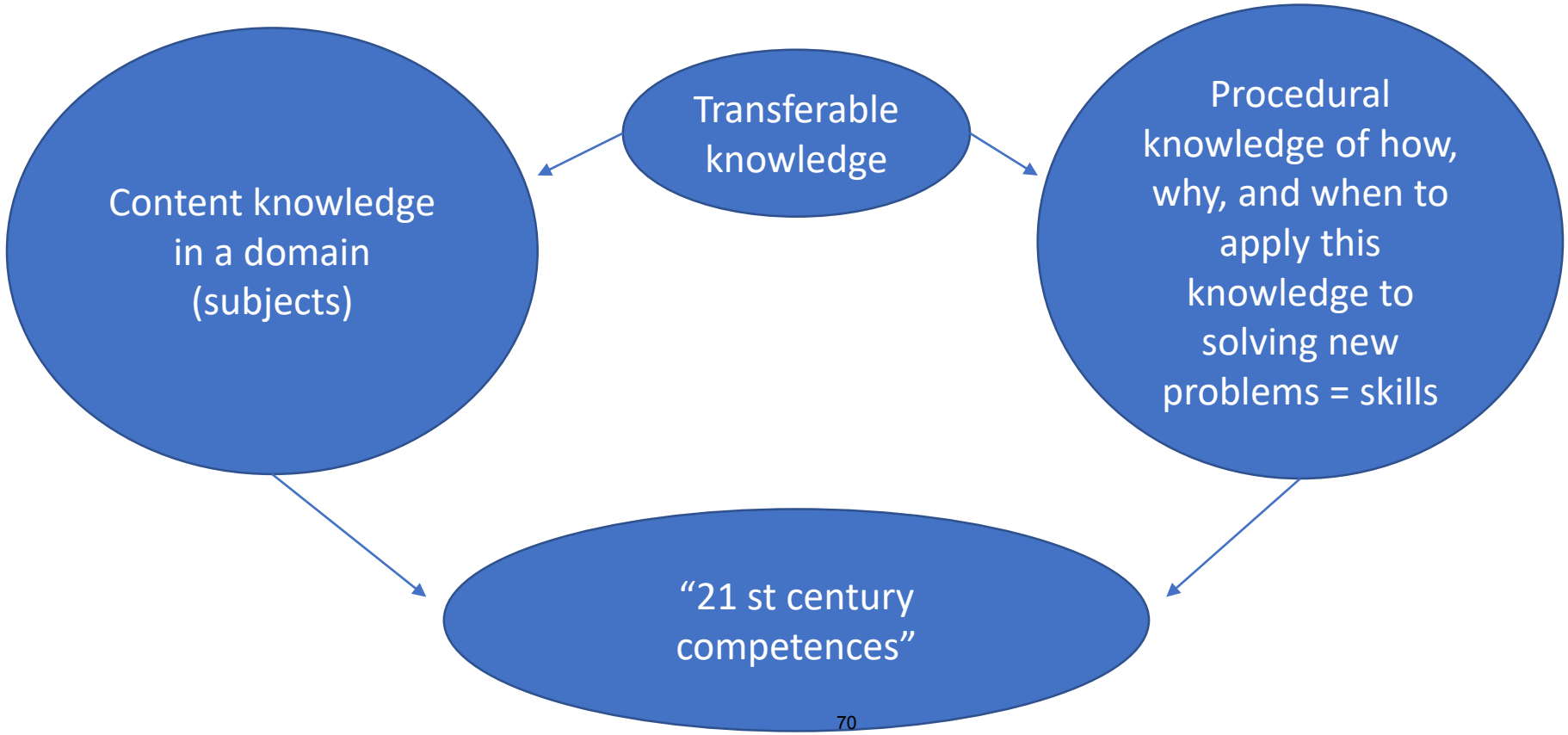
Two views of 21st century skills:

1. **Skills as general skills**
   - applied to a range of different tasks in various academic, civic, workplace, or family contexts.
2. **Skills as dimensions of expertise specific to- and intertwined with- knowledge within a particular domain of content and performance**
   - skills and knowledge are intertwined therefore use the concept competencies rather than skills.

References within National Research Council (2012).

Picture: Pixabay.com

- "Deeper learning": The process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations → transfer
- Product of deeper learning: transferable knowledge



Skills cards for group work

Creativity	**Critical thinking**
Innovation	**Problem solving**
Communication	**Decision making**

Collaboration	**Information literacy (including research on sources, evidence, biases)**
Media literacy	**Digital citizenship**
Flexibility	**ICT literacy**

Executive function (inhibition, working memory, shifting)	**Self-reinforcement**
Type 2 processes (self-monitoring, self-evaluation, self-reinforcement)	**Type 1 processes (forethought, performance, self-reflection)**

Information and communications (technology literacy) technology operations and concepts	**Flexibility and adaptibility**
Self-direction	**Personal and social responsibility (including cultural awarness and compentence)**

Productivity	**Research and inquiry**
Analysis	**Initiative and self-direction**
Leadership	**Reasoning/ argumentation**

Character	**Citizenship**
Dissemination of opinion	**Social intelligence**
Cognitive	**Intrapersonal**

Interpersonal	

New and adaptive ways of thinking	**Intercultural competences**
Digital skills	**Modern understanding of media**

Interdisciplinary	**Customized mindset**
Handling of cognitive “load”	**Virtual collaboration**
Complex problem solving	**Coordination with others**

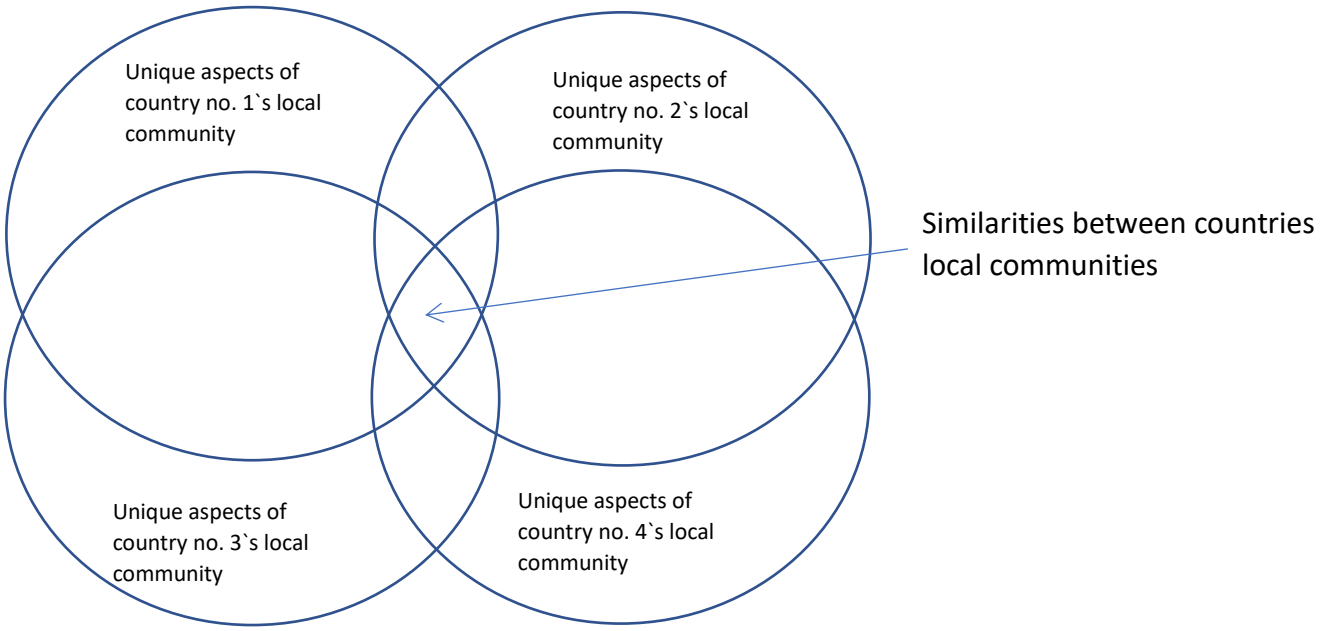
HR management	**Negotiation**
Quality control	**Service oriented**
Judgement and quorum	**Active listening**

Emotional intelligence	**Cognitive flexibility**

Group work assignment example

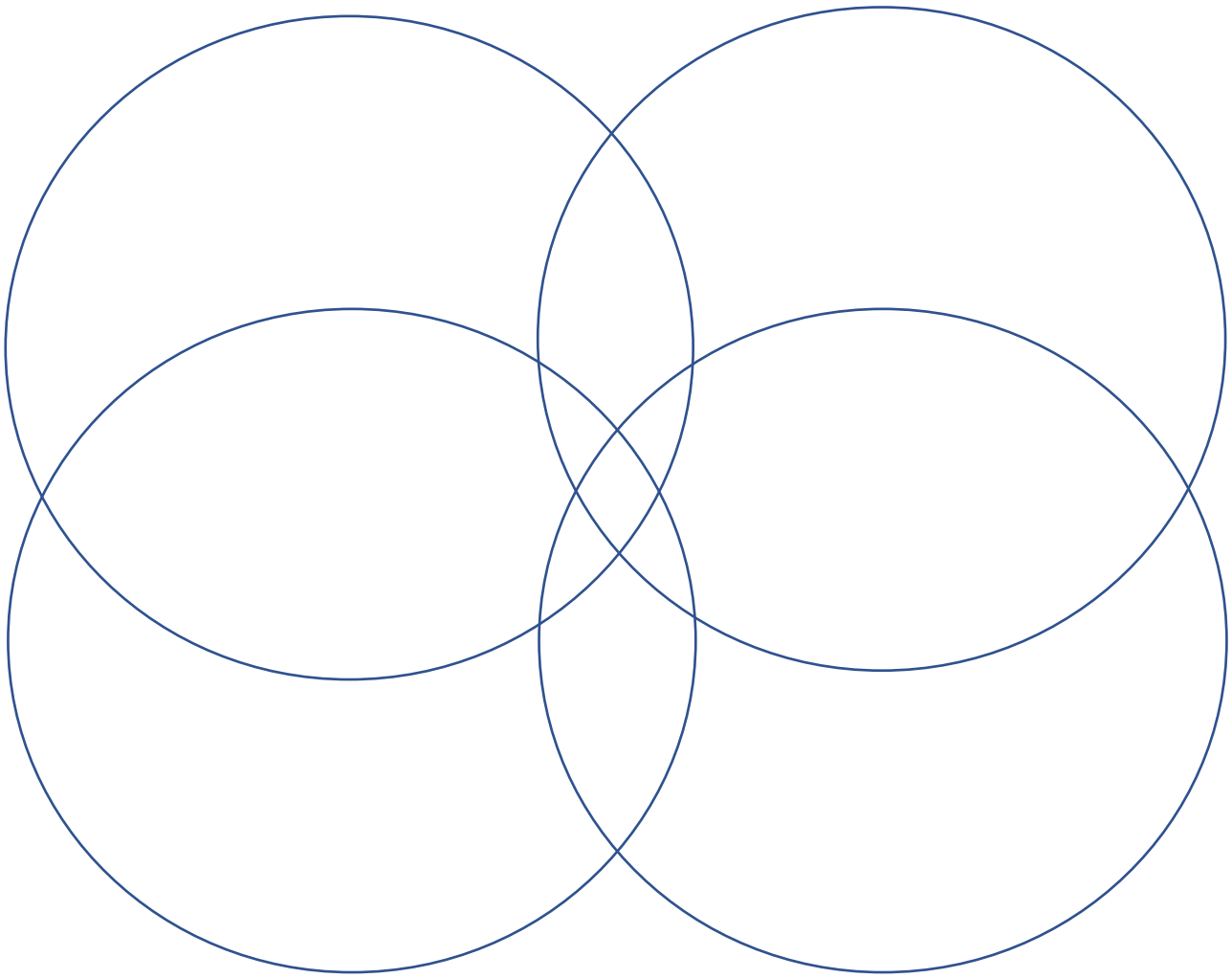
Contrasting localities - differences and similarities in your local communities using Venn-diagrams

- Using a Venn-diagram, write down the differences and similarities in your respective local communities.
- Compare the differences and similarities in your respective local communities.



Venn-diagrams

Edit the number of circles depending on the number of aspects compared.



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TEACHING MATERIAL COURSE 1 DAY 3

- Lecture slides day 3
- Mathematical example
- Intermission work 1

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Course 1 – Day 3

Entrepreneurship

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Entrepreneurship - narrow and broad concept

Entrepreneurship as doing enterprise

- In school and educational politics entrepreneurship is commonly associated with starting and running student enterprises

Pedagogical entrepreneurship

- A broader interpretation of entrepreneurship includes many skills related to exploration and innovation.

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Innovations through science or practical work?

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STI – Science, Technology, Innovation

- Innovation is mainly a result of systematic research in science using high technology
- It is regarded as the main way of doing innovation in modern western societies
- It has a particular strong position in the liberal market economies in the Anglo-American world
- It is also the main approach in the innovation policy of the Norwegian government
- This way of doing innovation is especially prominent in south-east Norway. Oslo Cancer Cluster is a good example

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DUI - Doing, Using, Interacting

- Along the coast of Norway we find some very innovative regions
- They have long traditions with industry related to shipbuilding, machinery and furniture
- The innovations in these industries have been developed through practical work – “a try and fail strategy”
- The fishing boats of north Norway are excellent examples of incremental innovations through generations.

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CCI – Combined and Complex Mode of Innovation

- In a high technology world it has gradually been difficult to rely solely on practical innovations
- In maritime industries you have to do systematic research and development in order to succeed
- Norsafe – a producer a lifeboats is a good example
- It seems that this CCI approach has strong positions in more coordinated market economies like Germany and Scandinavia

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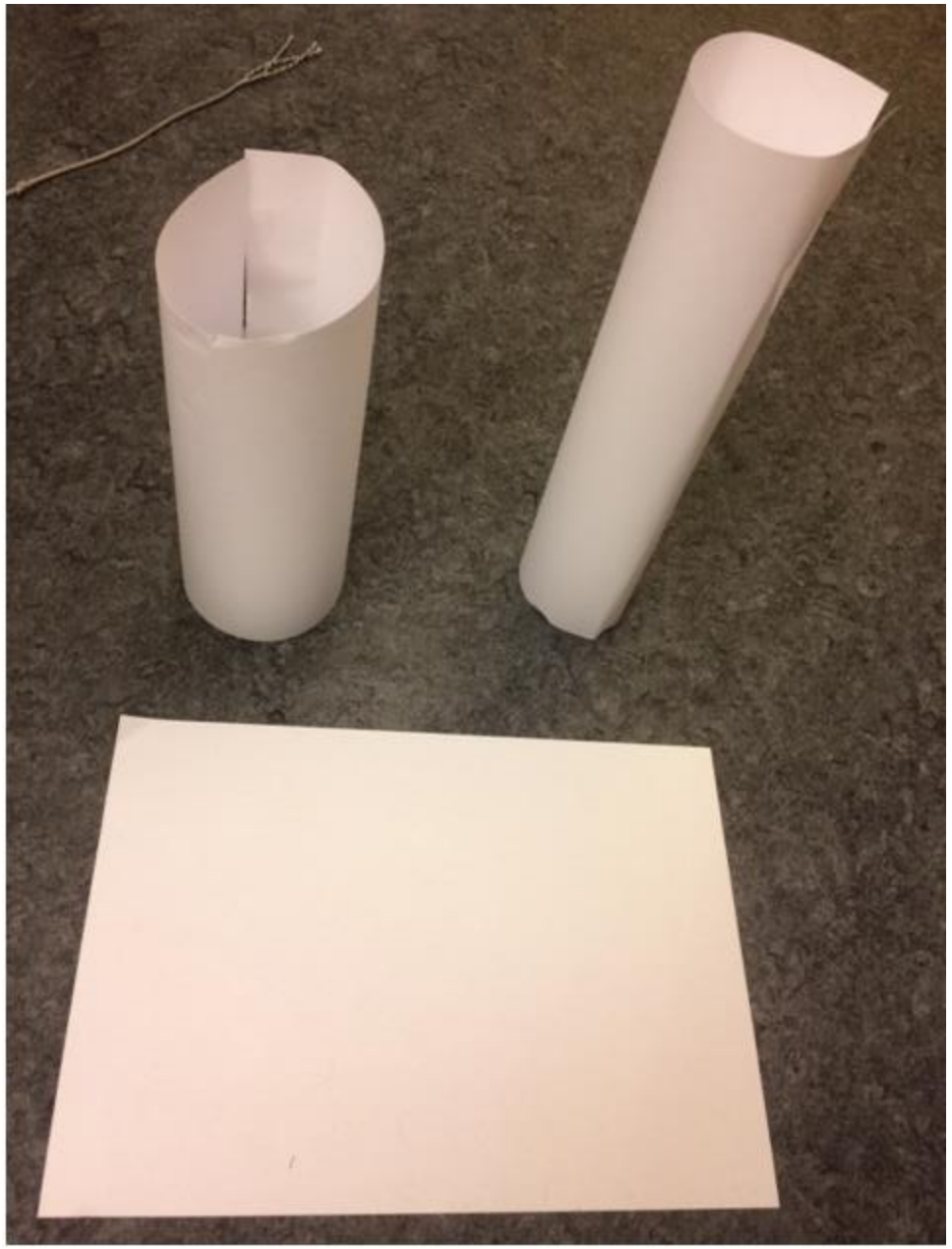
5. Group work assignment

- Is this narrow or broad concept of entrepreneurship?

- Work in groups
- Discuss the given example from mathematics: Could this be interpreted in the narrow or broad concept of entrepreneurship? What skills do you need in entrepreneurship?

Picture: Pixabay.com

Area and volume. Design



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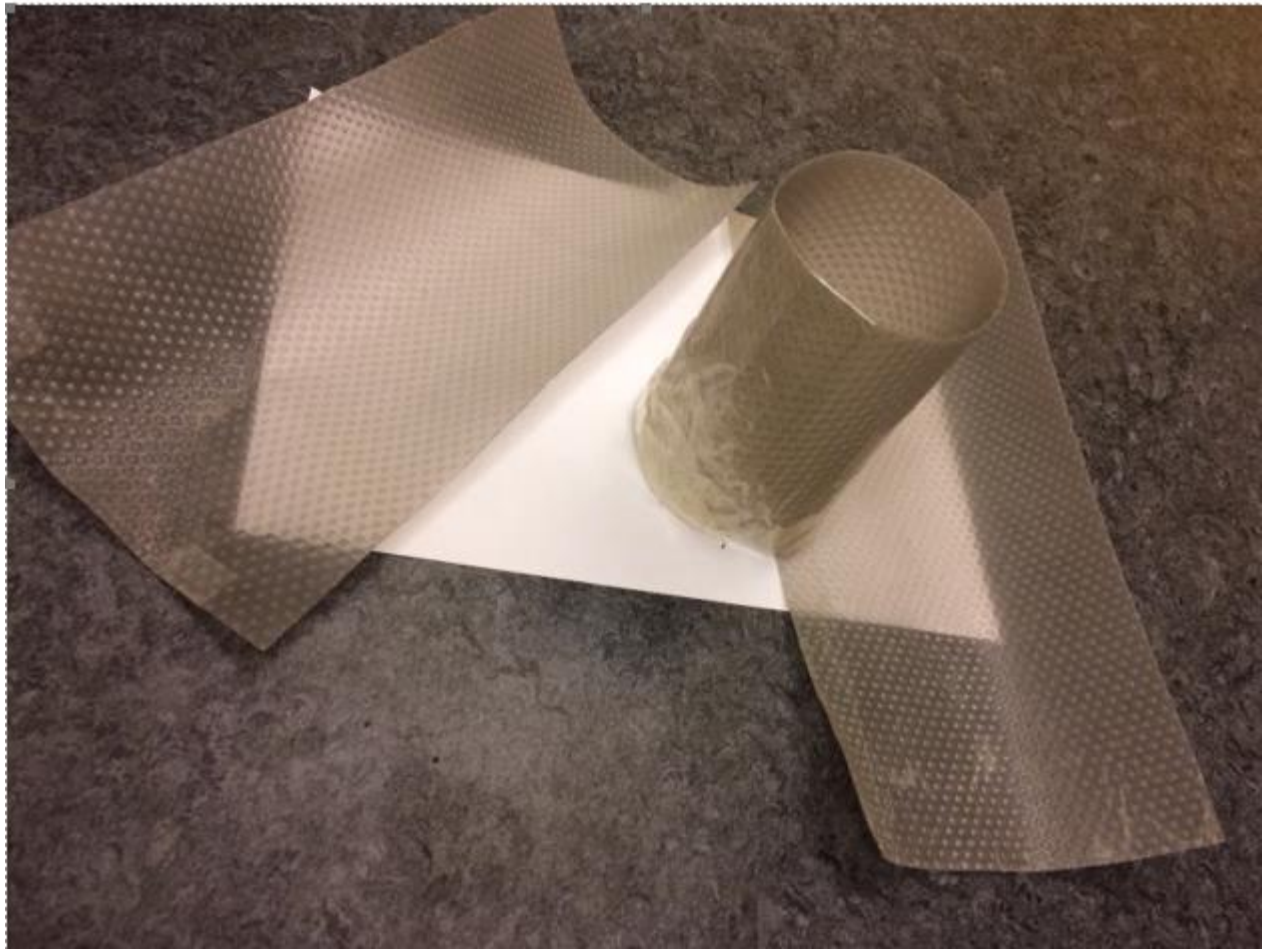

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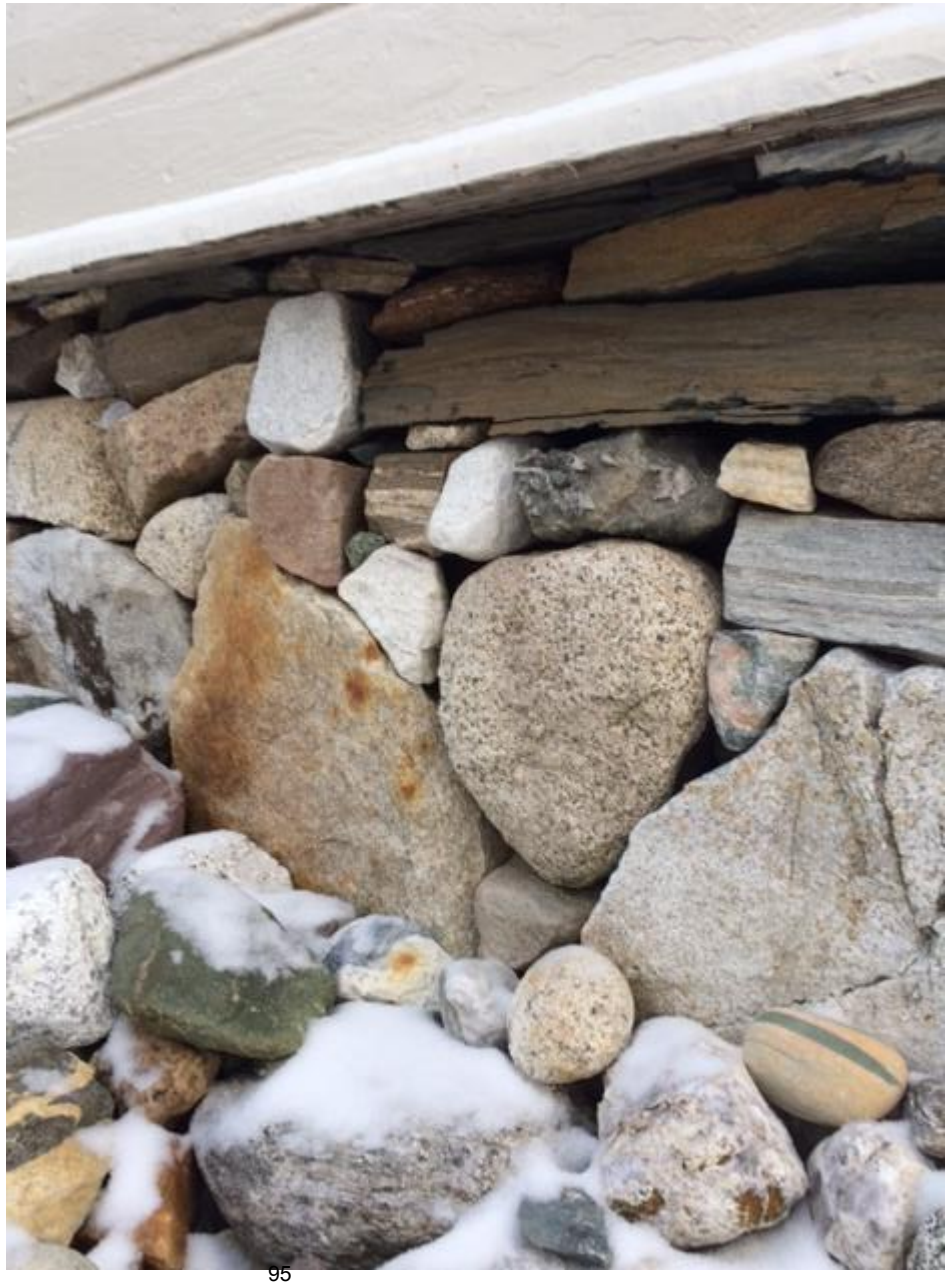
To build a foundation for a house



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Way of working:

1. Into context
2. Workshop
3. Prepare presentations
4. Math Congress
5. Mini lessons


TINE
Lettmelk 1,0 % fett
Fire gutter har til sammen spist 11 jordbær.
Alle har spist minst ett jordbær.
ingen av dem har
spist like mange jordbær.
Tre av dem har spist
9 jordbær til sammen,
og en av dem har
spist 5 jordbær.
Hvor mange jordbær spiste
gutten som spiste flest jordbær?

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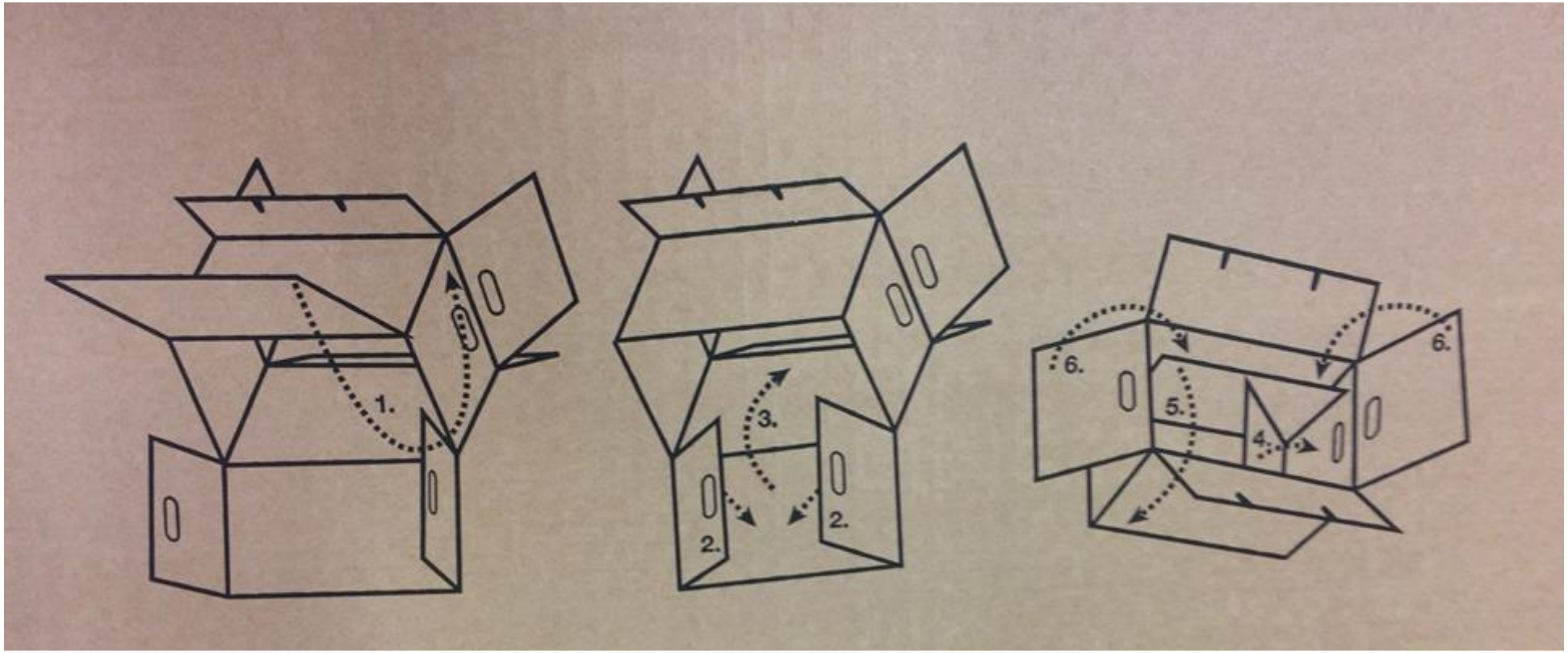
To fold a box



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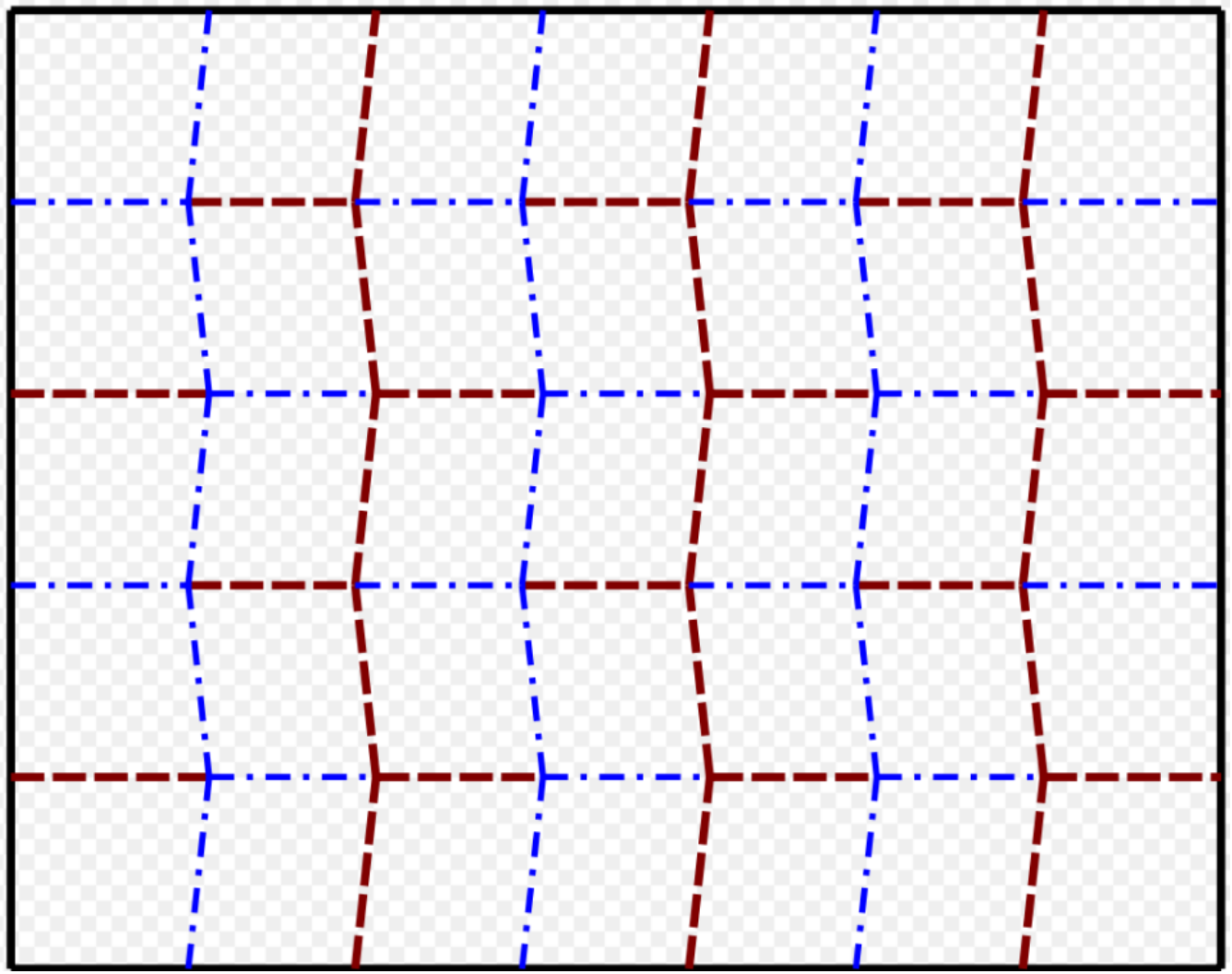

https://no.wikipedia.org/wiki/Miurabretting#/media/Fil:Miura-ori.gif

Masu box

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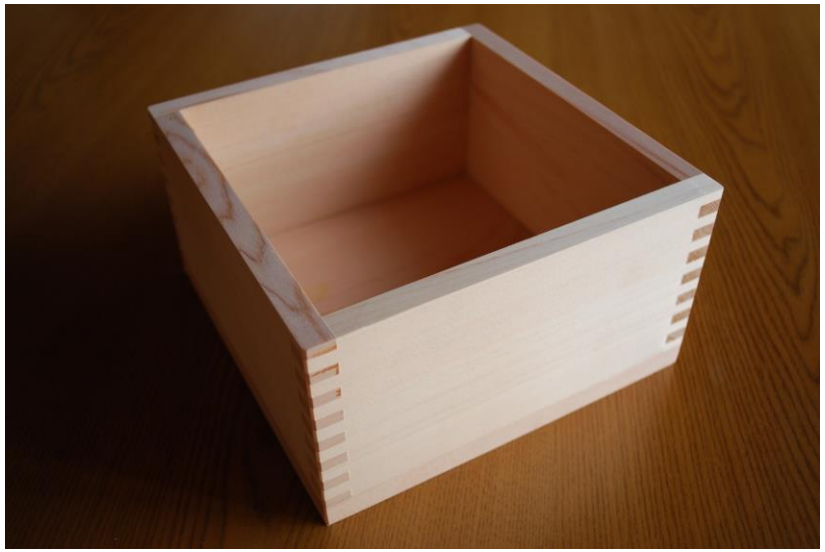

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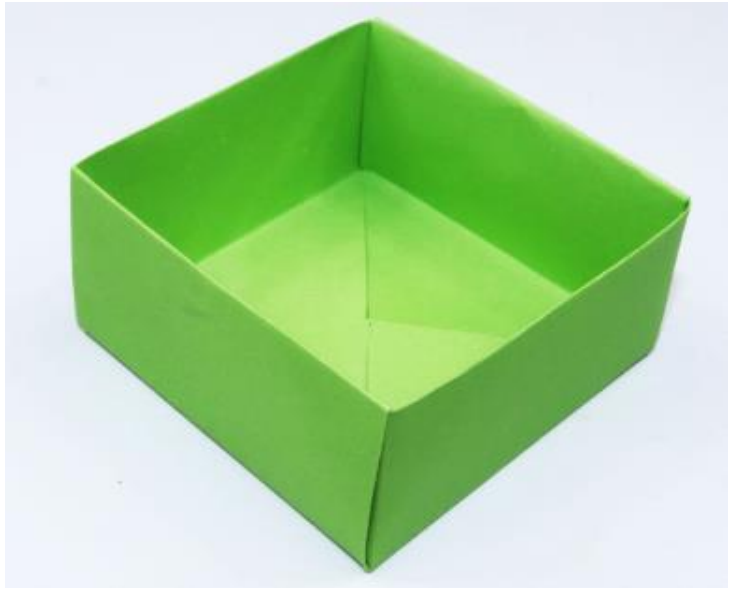
Masu boxes

For more than 1300 years Masu boxes has been a part of Japanese culture. Traditionaly made of wood with a quadratic bottom. Used for meassuring of rice.

We are going for a paper version.
The resulting form is half a cube

Starting point: A square paper.



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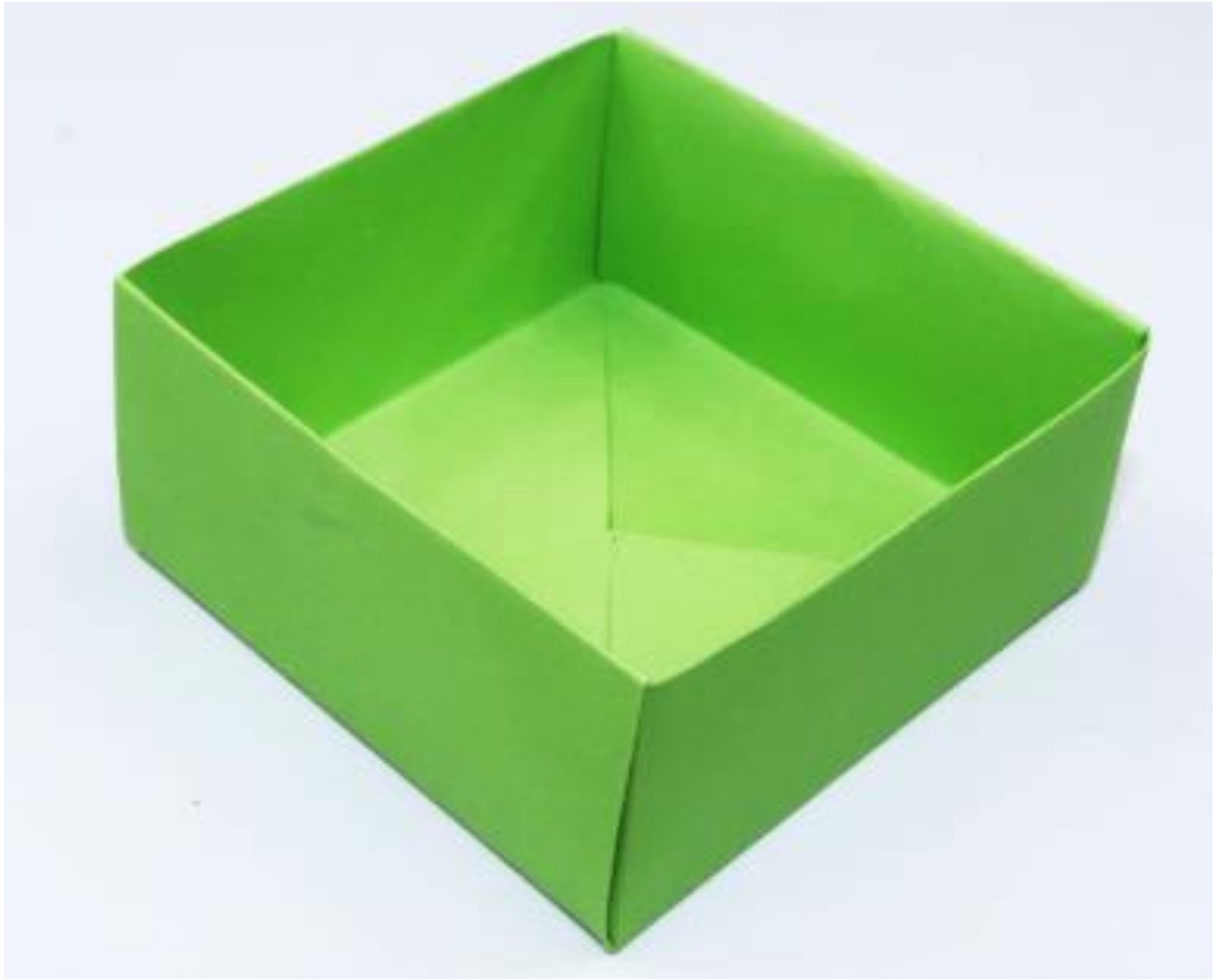
Masu box



https://www.youtube.com/watch?v=Cd5Z8hmcb10

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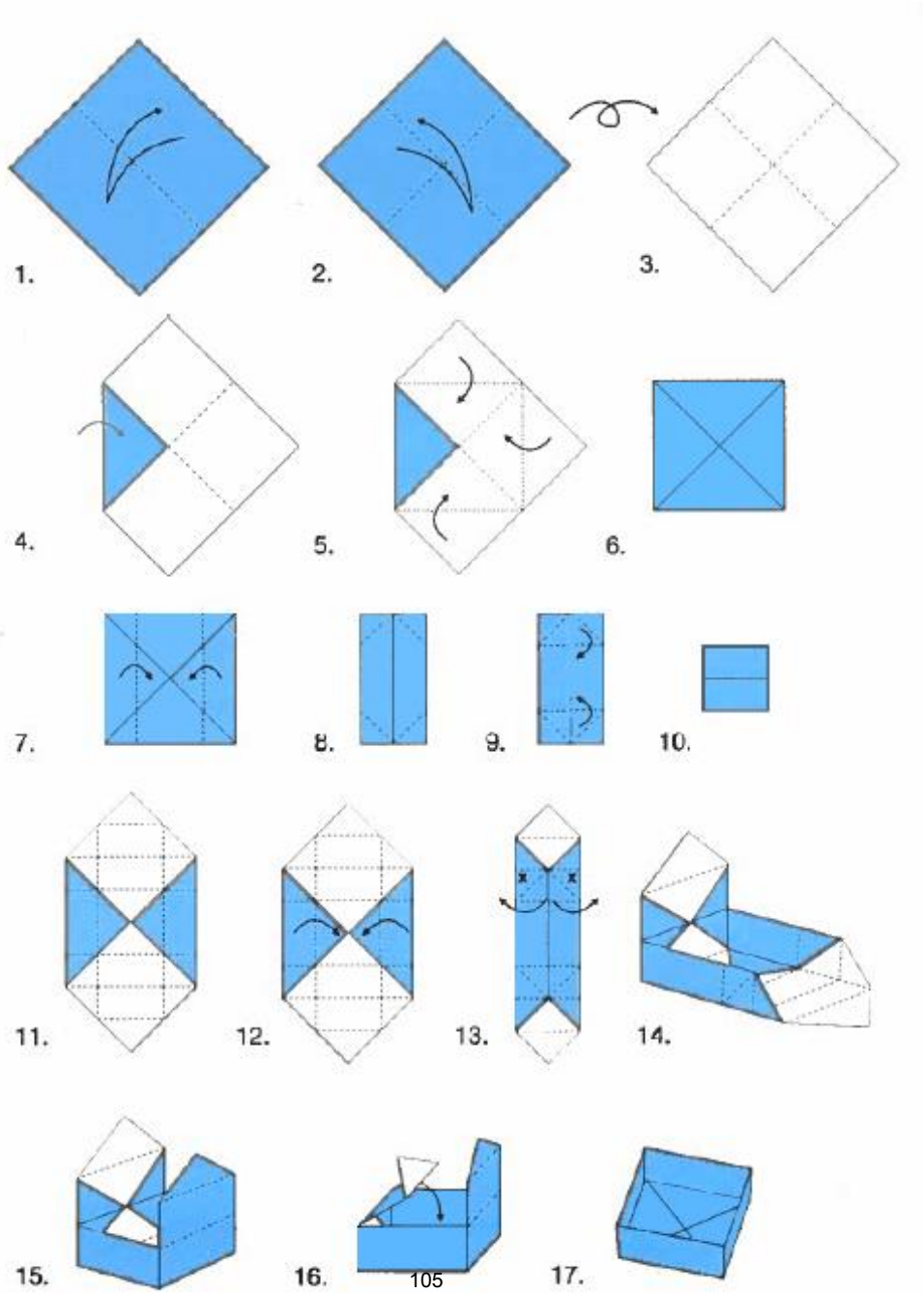

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2. Group work assignment

Challenges:

1. What is the volume of the small box (20x20 cm)?

2. What is the volume of the big box (30x30cm)?

3. How large is the bigger one compared to the smaller one?

4. How do the length of the sides of the square paper relate to the volume of the box? Study the figure showing the unfolded paper showing the bottom in red.

5. Can you plan for making a box with a volume of 0.5 liters?

Work in groups

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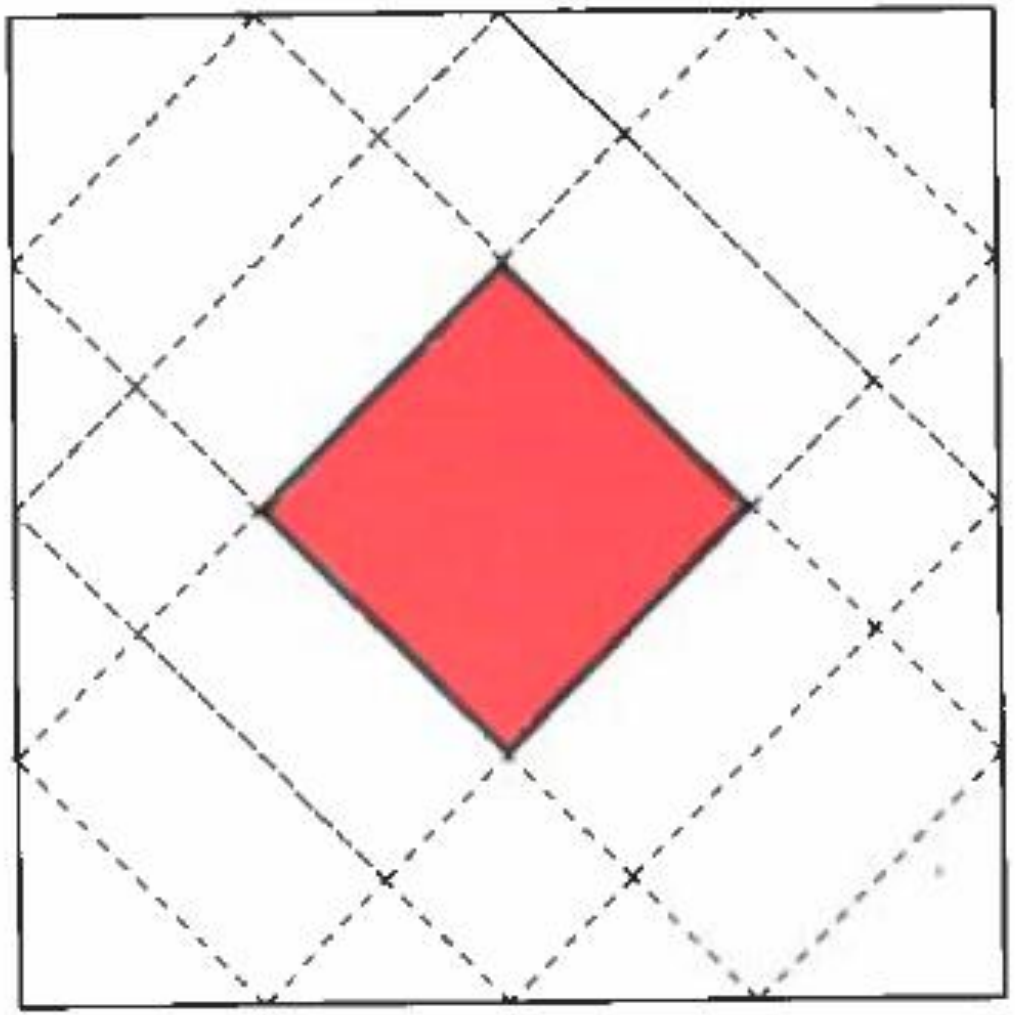

The landscape of learning: area and volume on the horizon showing landmark strategies (rectangles), big ideas (ovals), and models (triangles).

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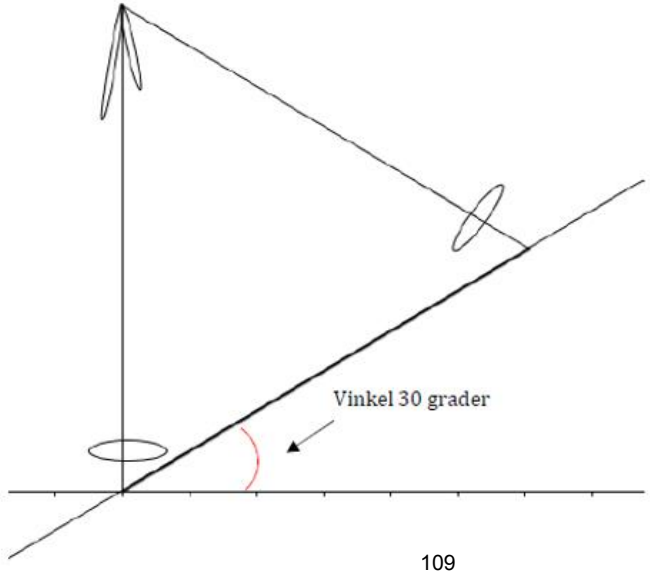
Avalanche



Is this a narrow or broad concept of entrepreneurship?

- Work in groups
- Discuss the example from mathematics below. Could this be interpreted in the narrow or broad concept of entrepreneurship? What skills do you need in entrepreneurship?

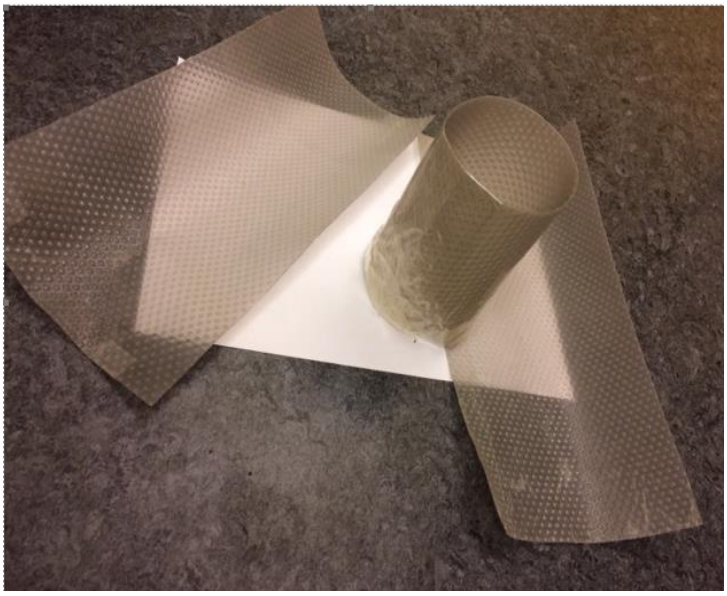
Design and volume

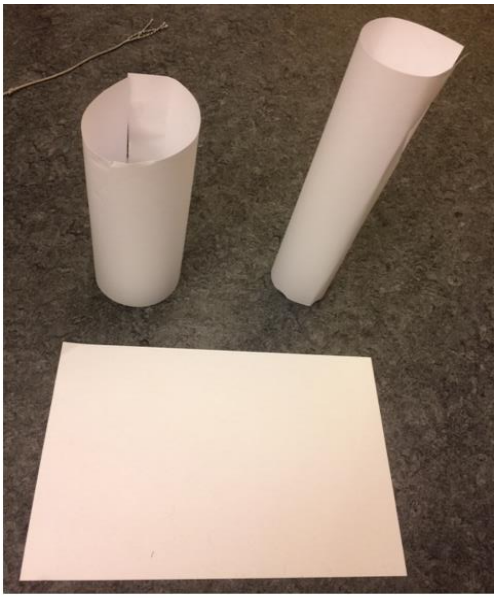
You have a sheet og paper or plastic. The sides are a and b (cm), a≠b .

You could make 2 different cylinders using the two sheets to make the side surface of the cylinders.

Is the volume of the two cylinders the same?

Calculate and explain.





Intermission work 1 – between course 1 and 2

Criteria

- Define the curriculum goals covered in various subjects (interdisciplinary)
- Teaching must include one or several local institutions or be interdisciplinary
- Describe the learning arena and the context
- Which of the 6 C's are in focus during the teaching?
- The teaching must be tested in a class

Assignment

- Test the common teaching method in every country represented in the group
- Write a description of the teaching method and a one-page reflection on your experiences and the implementation process
- In the beginning of the next seminar you will be asked to compare these reflections into a Venn-diagram
- Based on the Venn-diagram the groups should make a 15-minute presentation, including:
  - Overview of the teaching tested (based on the criteria)
  - Experiences from testing the teaching
  - The reflections
- Each group presentation should end with a question, a problem or a challenge which will be discussed in a plenary session

TEACHING MATERIAL COURSE 2 DAY 1

- Lecture slides day 1
- Group presentation intermission work

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Course 2 – Day 1

Intermission work – sharing knowledge

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What did we do the last time?

- Compared (Venn-diagram) local communities and school systems
- Group work on 21st Century skills (hats)
- Entrepreneurship (narrow and wide concepts)
- Visit from local enterprises

What have we done since?

- All groups have implemented teaching resources to develop 21st Century skills
- All groups have given an extensive description of the teaching resource and implementation of the intermission work
- It seems that the groups succeeded in implementing 21st Century skills in the intermission work
- In general: environmental topics related to sustainability

What were the results?

- Use the 21st Century skill **critical thinking**: what problems did you encounter in your implementation (if any)? Did you use any new practices as part of your teaching resource? Did your teaching resource lead to positive development of the intended skills for all students?

→ background for the reflective questions

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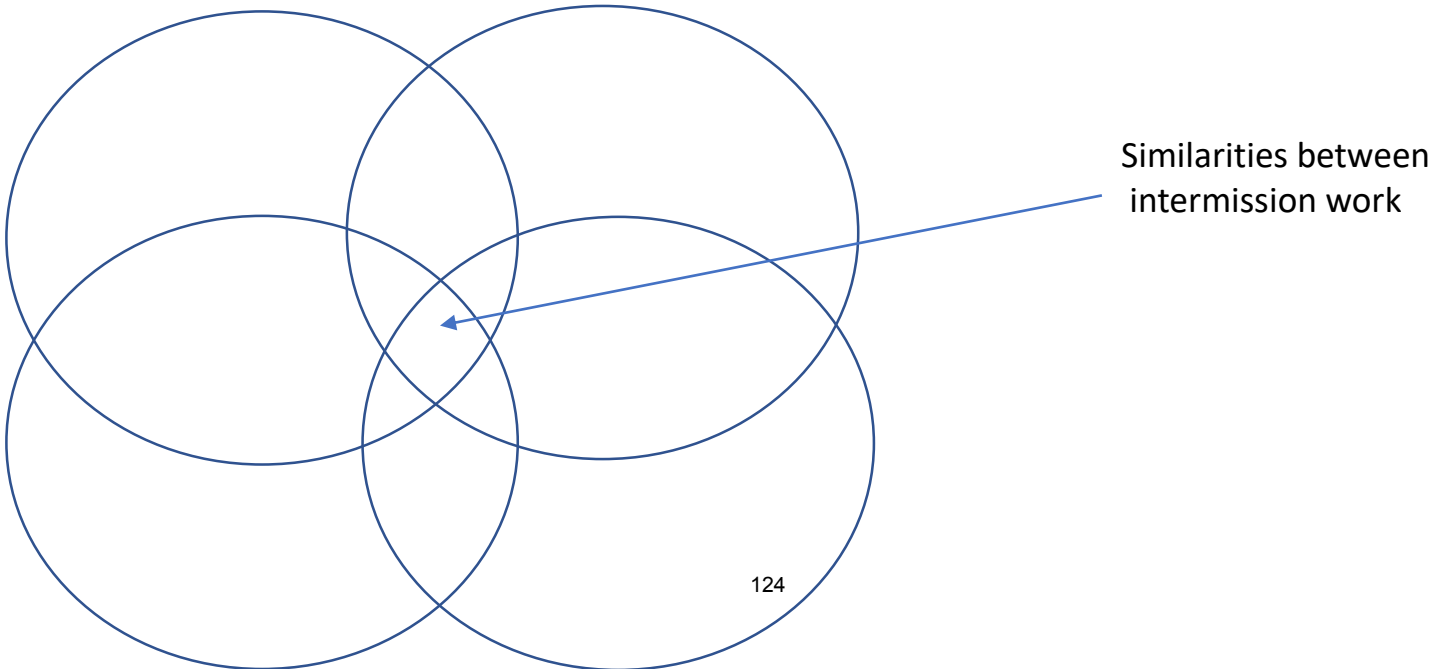
1. Group work assignment

- Contrasting localities- differences and similarities in your local communities

- Work in groups
- Using a Venn-diagram, discuss and write down similarities and differences in implementation of your intermission work. Focus on practical implementation and the 6 C's.



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Reflective questions for presentation of the intermission work

- Which similarities and differences in experiences in implementation of the intermission work did you find across countries/schools?
- What did you bring specific from the first seminar into your teaching resource?
- What do you think you have changed in your teaching practice and what is new concepts in old practices?
- Was something perceived as new experiences for the students? Experiences of novelty space linked to the teaching resource?

When discussing and considering the teaching resource the concept below can be used.

Was the teaching resource:

- Interdisciplinary or multidisciplinary
- Inductive or deductive
- Place-based learning or place to learn

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Reflective questions for presentation of the intermission work

Often, we are touching on one or more of the 6 C`s in our teaching resources (varies with depth and positive or negative development of the 6 C`s)

- How do you think your teaching resource, developed as part of the intermission work, lead to development of the 6 C`s? Do you think you developed other C`s than originally planned for?
- What parts of the teaching resource led to development of your chosen C`s and why. Elaborate.
- Did you experience the student achieved the teaching goals as you worked with the 6 C`s.

When discussing and considering the teaching resource the concept below can be used.

Was the teaching resource:

- Interdisciplinary or multidisciplinary
- Inductive or deductive
- Place-based learning or place to learn

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Presentation of the intermission work

Presentation

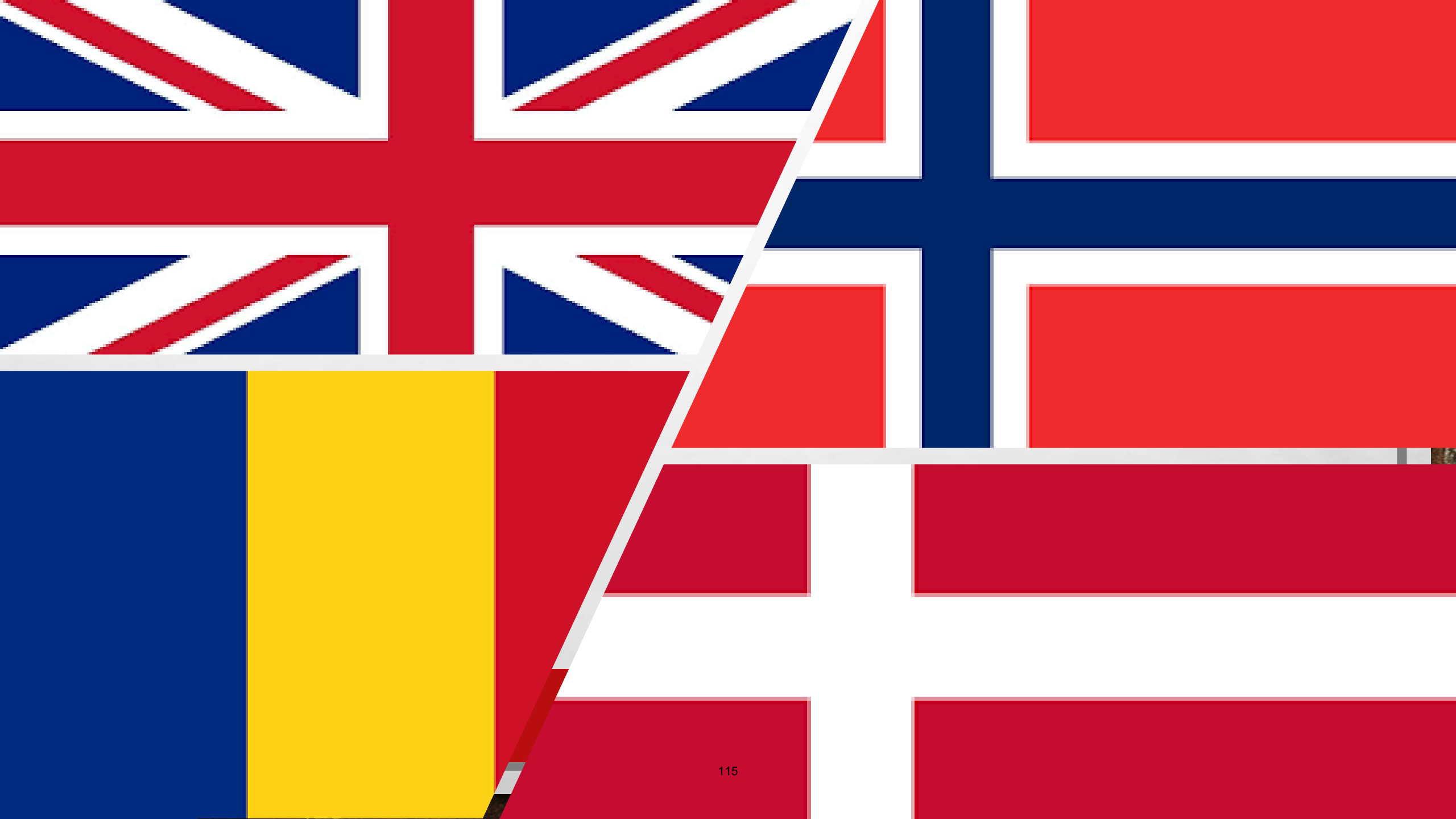
- 10 minutes for each group (intermission work)
- The presentation should involve:
  1. A short presentation of the learning resource/approach (what C`s did you focus on) and practical implementation with focus on similar and different experiences.
  2. Thoughts on the reflective questions.
  3. In addition, reflect on how your work on the intermission work can bring new knowledge and experiences on how to develop the 6 C`s.

Emphasise on point 3 in the presentation.

21ST CENTURY SKILLS FOR 21ST CENTURY AWESOMENESS. TEAM 1

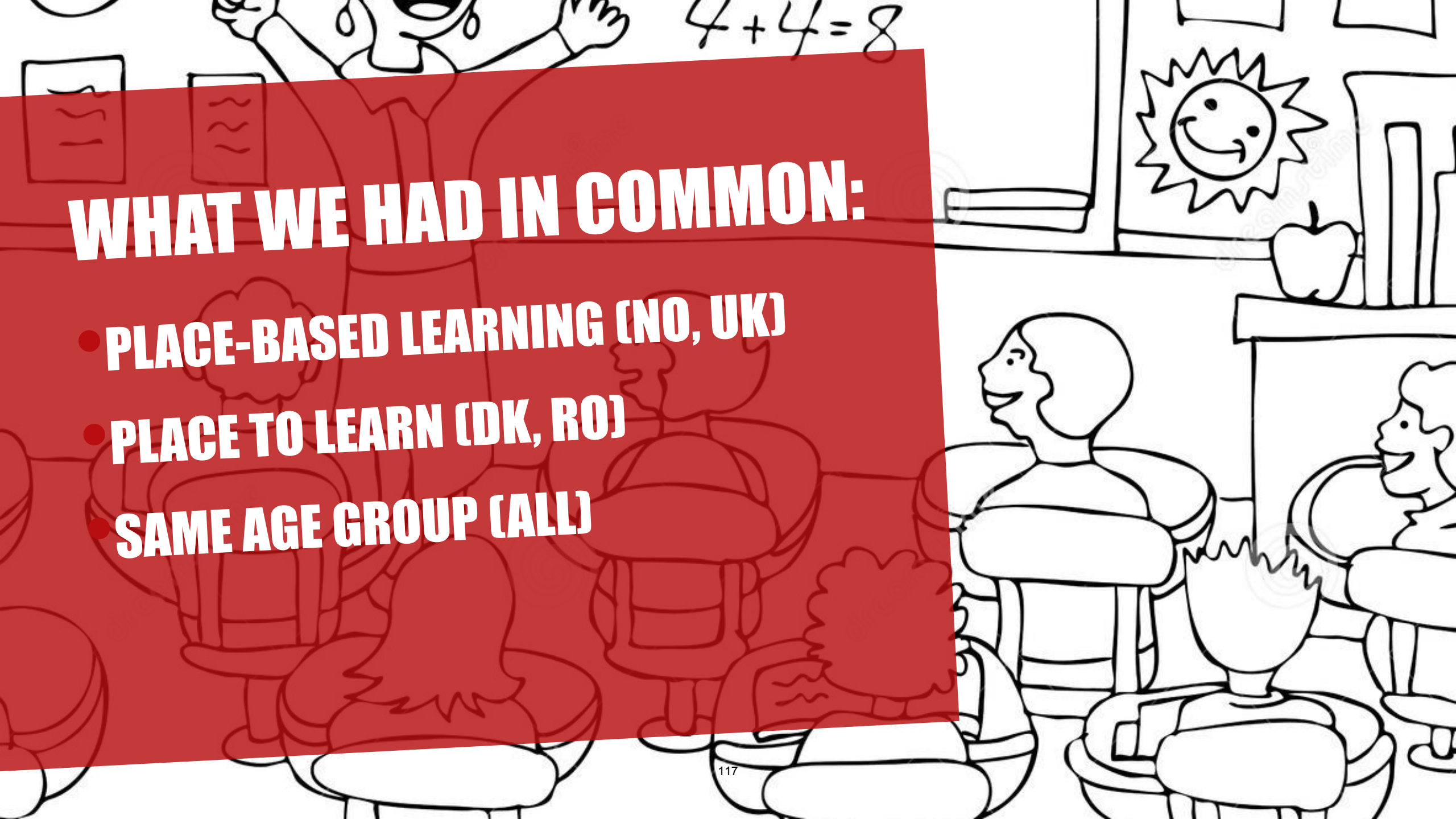
INTERMISSION WORK

VEJLE, 30.09.2019



COMMON SKILLS:

- CREATIVITY
- CRITICAL THINKING
- COLLABORATION
- CHARACTER



WHAT WE HAD IN COMMON:

- PLACE-BASED LEARNING (NO, UK)
- PLACE TO LEARN (DK, RO)
- SAME AGE GROUP (ALL)

COMMON METHODS:

- STUDENT RESEARCH (NO, DK, RO)
- MULTI-DISCIPLINARY (NO, DK, RO)
- INTER-DISCIPLINARY (NO, UK)
- GROUP WORL (ALL)

VARIA:

CITIZENSHIP (UK, RO)

COMMUNICATION (DK, RO)

INDUCTIVE (NO, DK, RO) – DEDUCTIVE (UK)

THEMES WE USED:

- CONSPIRACY THEORIES (NO)
- ADVERTISING (NO)
- MAKING DRUGS TO FIGHT DISEASE (UK)
- REBRANDING (DK)
- ADVERTISING PHILOSOPHY AND ARTS (RO)

WHAT WE HAVE LEARNT:

- WE SHOULD NOT BE AFRAID OF LETTING STUDENTS EXPLORE
- WE SHOULD GIVE STUDENTS LESS GUIDANCE THAN WE ARE USED TO
- THE 6CS SKILLS DEVELOPMENT SHOULD FIT THE NORMAL PROCESS OF LEARNING FOR THE STUDENTS
- WE SHOULD ALLOW STUDENTS TO MAKE MISTAKES AND IMPROVE THEIR PROCESS IN LEARNING
- WE DID NOT DECIDE TO FOCUS ON CHARACTER, NEVERTHELESS WE REALIZED IT WAS A COMPETENCY THAT ALL OUR STUDENTS DEVELOPED

MOVING FORWARD:

- NO: NEXT PROJECT WILL BE FOCUSED ON CHARACTER, USING THE SAME FRAMEWORK
- DK: STUDENTS ARE USING THE SAME FRAMEWORK FOR ANOTHER PROJECT
- RO: WE WILL USE THIS TYPE OF COMPLEX ACTIVITY FOR OTHER SUBJECTS
- UK: WE WILL USE THE SAME FORMAT FOR OTHER LESSONS

TEACHING MATERIAL COURSE 2 DAY 2

- Lecture slides day 2
- Presentation business – school cooperation

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Course 2 – Day 2

Learning

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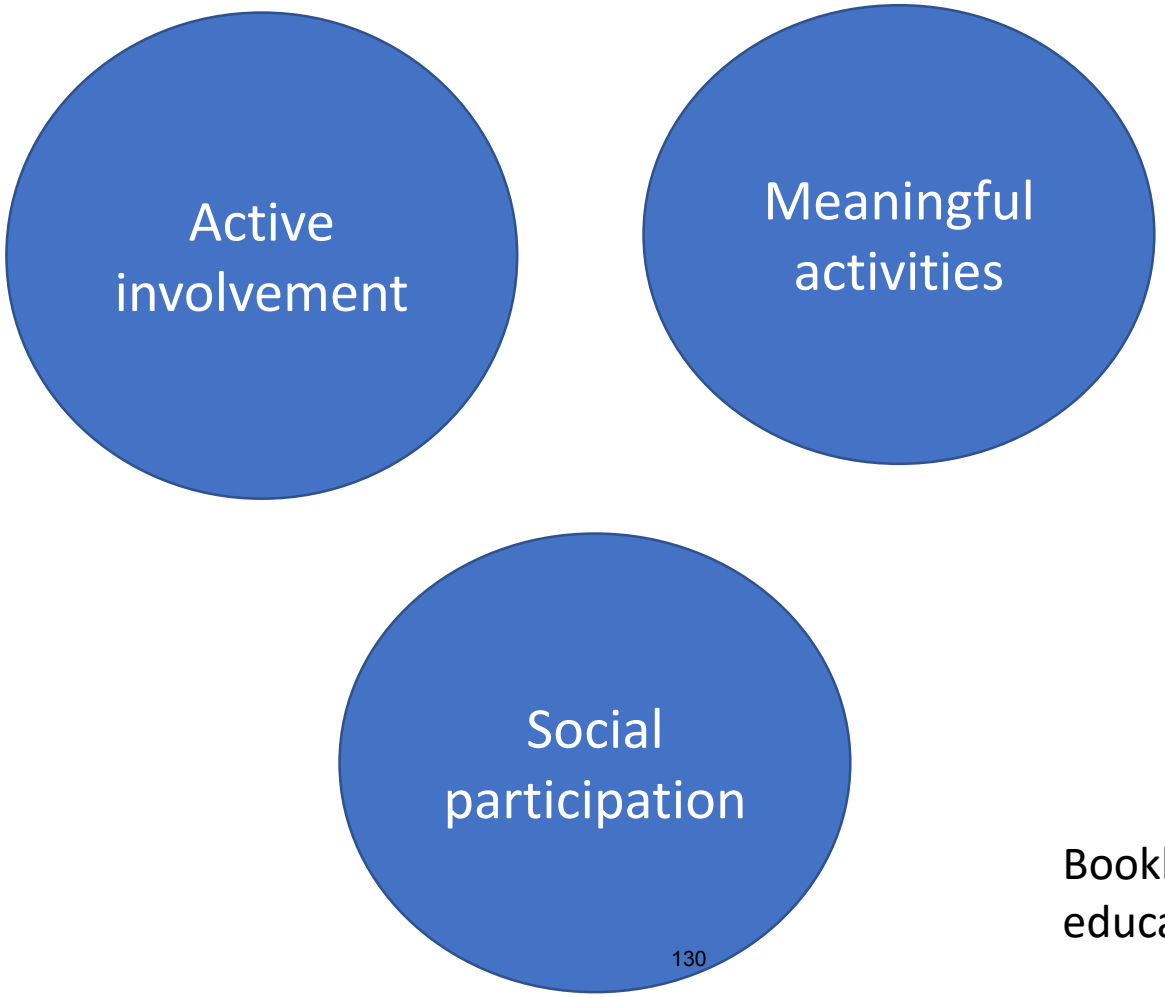
Three principles of designing learning environments



Booklet by UNESCO, International bureau of education, “How Children Learn”.

Vosniadou, 2001

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Dewey: real life experiences and continuity

- The world is “integral and total” for the student, but curriculum divide topics from the rest

Two principles when choosing curriculum topics:

1. The curriculum topics should be related to practical tasks in school and in the real life outside school.

2. Continuity in the teaching: The ideal is that every learning experience should serve for better understanding of later academic topics, and the academic topics should serve for better practical learning later on.

Leading to→

Phase 1.: prework

Phase 2.: practical task, multidisciplinary task and experience from other settings than the classroom

Phase 4.: reflection

(Dewey, 1966, Dewey and Dewey, 1915)

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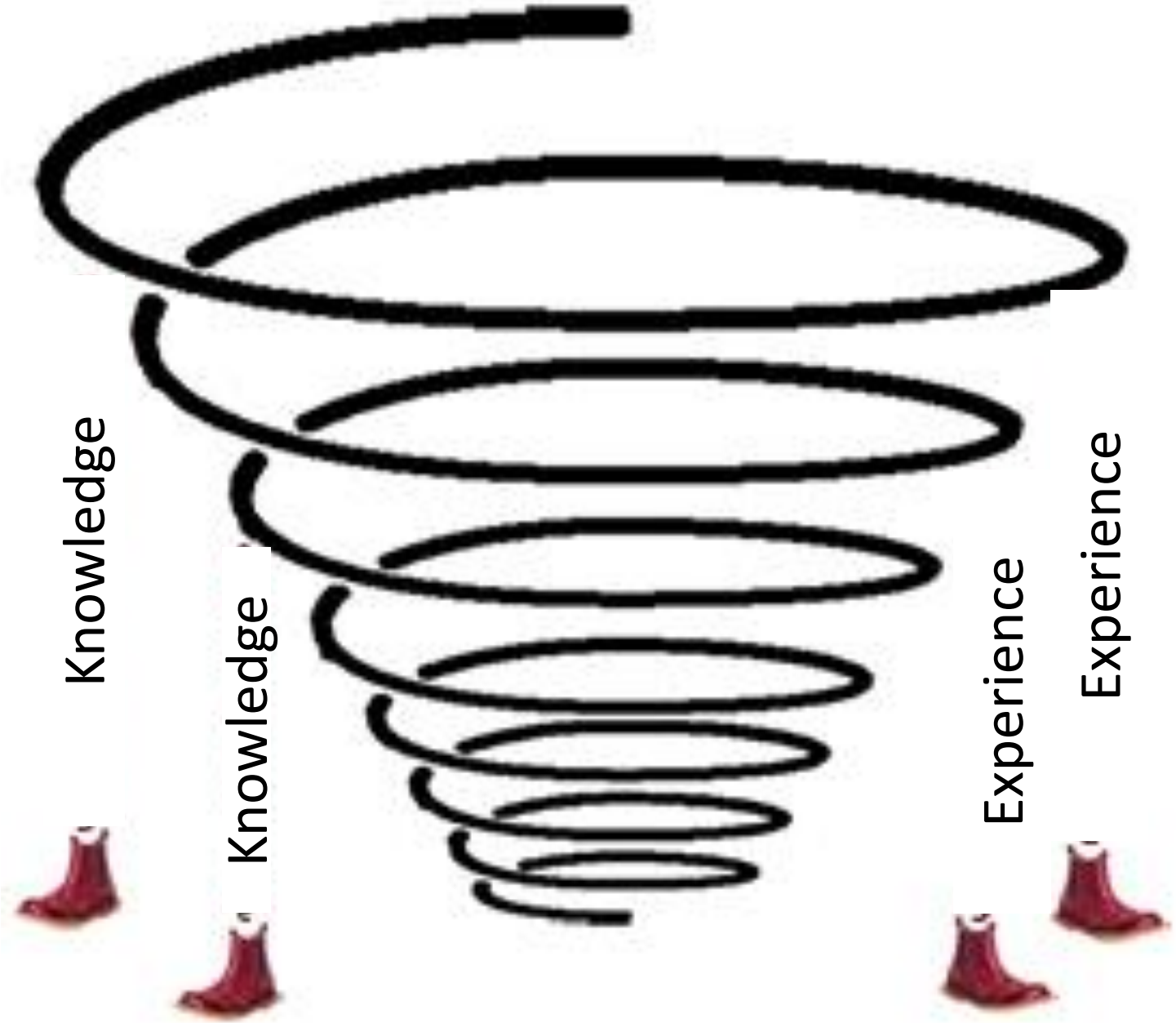

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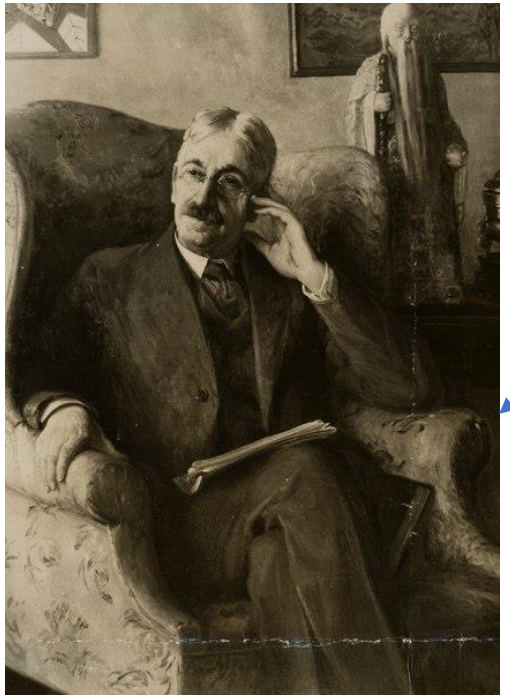
Working with academic subjects as a whole or divided into pieces (step by step)?

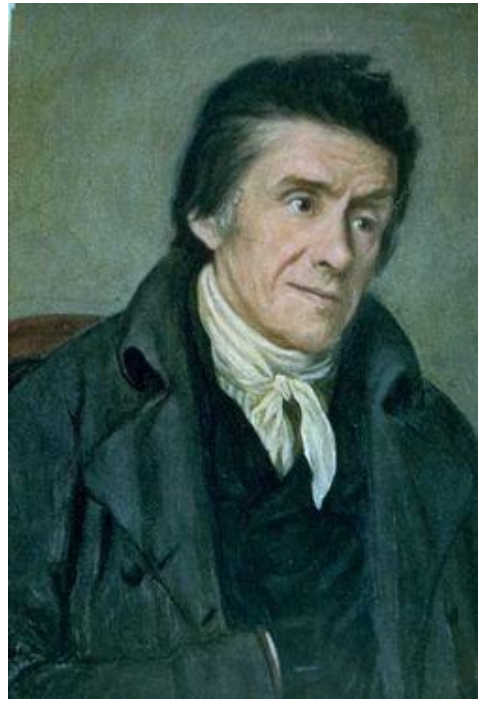
John Dewey



Picture: wikipedia.org

Two different views of what`s best for the pupils

Johann Heinrich Pestalozzi



Picture: wikipedia.org

(Dewey, 1966, Dewey and Dewey, 1915, Jordet, 1910, Myhre, 1966)

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6. Group work assignment

-working with academic subject as a whole or divided into pieces?

Work in groups

Discuss this questions:

- What is preferable, “whole or divided”, in developing the 6 Cs?
- What is feasible at your school?

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Learning in an inductive or a deductive way?

Inductive learning:
Student-centred: experience lead to understanding and conclusions

Deductive learning:
Teacher-centred- instructions are theory-based.

- An example from secondary language teaching (Schaffer, 1989) :
  Inductive: The students have to recognize and find the structure and patterns in the grammar themselves
  Deductive: The students get an explanation of the structure and patterns in the grammar in the beginning

- We are often somewhere between inductive and deductive teaching.
  - Guided inductive teaching is an example of a method somewhere in the middle (see e.g. Vogel, Herron, Cole and York, 2011). This involves inductive learning for students, given boundaries and framework beforehand.

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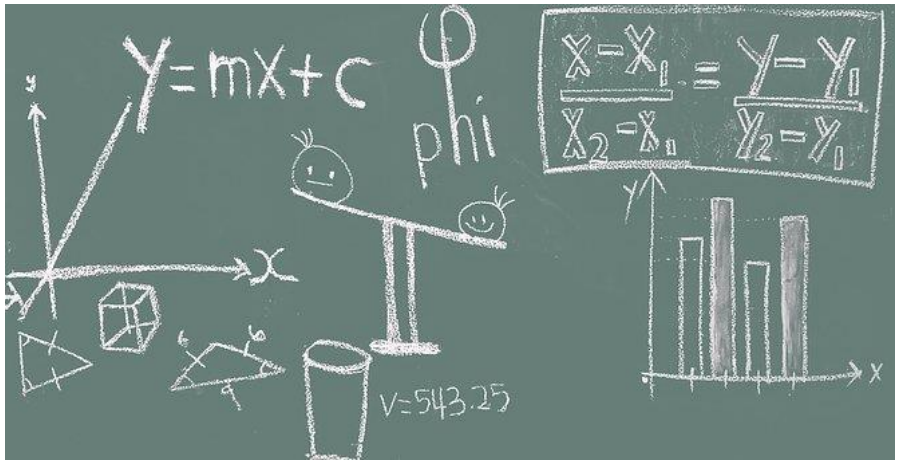
“Teacher feeding knowledge to the student”/deductive and explorative learning/inductive



Picture: Pixabay.com

It is not just what you do and where you choose to go, but how you behave and what kind of questions you ask (Askew, 2000).

Picture: Pixabay.com

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7. Group work assignment

-deductive and inductive learning

Work in groups

Discuss this questions:

- In what way can a inductive versus a deductive learning strategy contribute to develop the 6 Cs?

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Learning subjects in a concrete or abstract way?

Concrete learning tasks	Abstract learning tasks
Immediate learning results	Easier to transfer knowledge to new situations
Easier to remember and to understand	
Easier to use informal strategies	
Interesting and motivating	

Belenky and Schalk, 2014.

There are benefits with both concrete and abstract learning tasks.

- We need to use both.
- One solution is to start with concrete learning and gradually be more abstract.
- That will give concrete experiences and possibilities to generalize.

(Based on a reviews by Fyfe, McNeil, Son and Goldstone (2014))

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8. Group work assignment

-Concrete and abstract learning

Work in groups

Discuss this question:

- In what way can concrete versus abstract ways of learning contribute to develop the 6 Cs?

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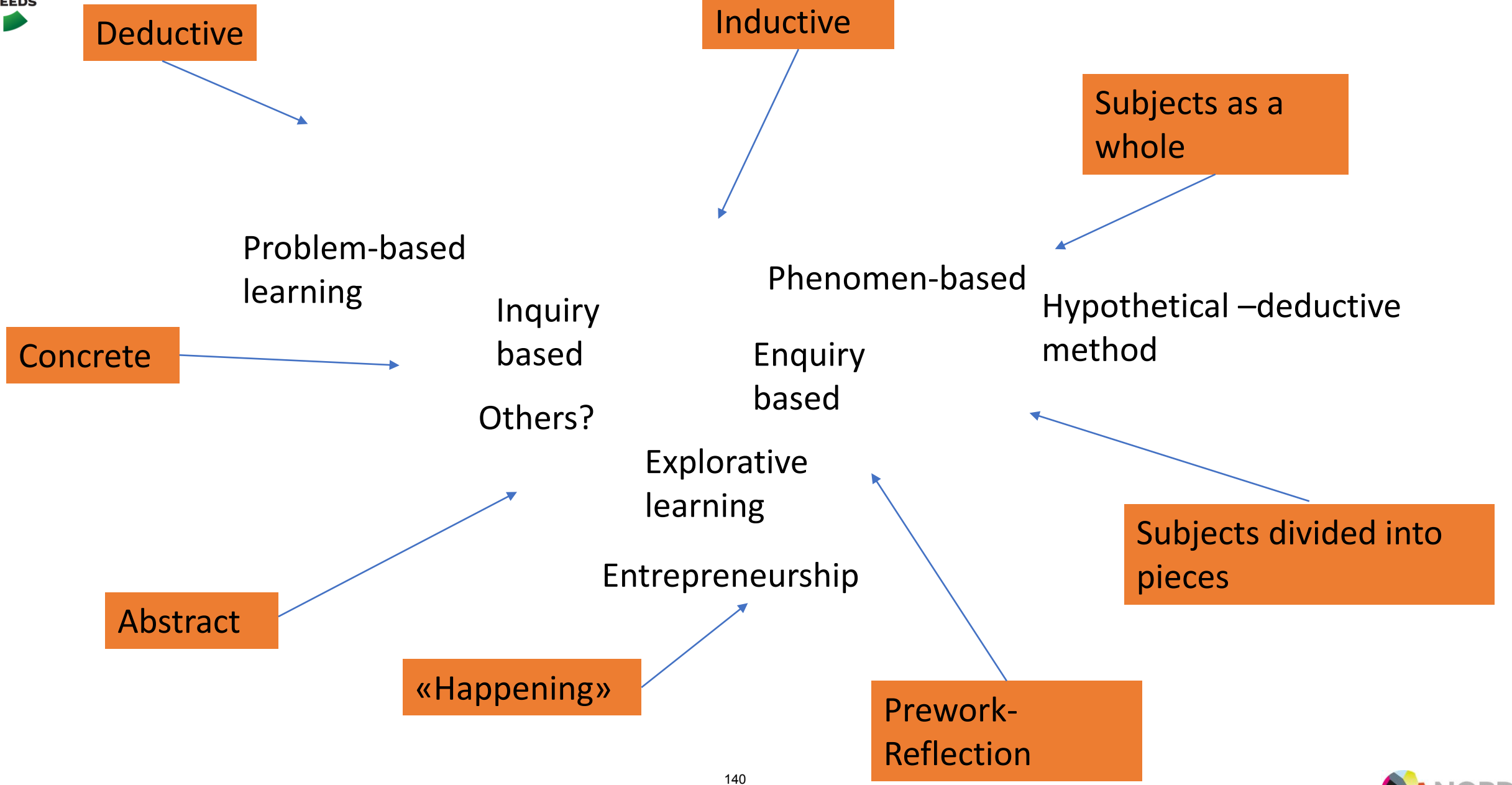

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9. Group work assignment

-Teaching methods theoretical concepts

Work in

Discuss this question:

- Choose a couple of the teaching methods in the previous slide and relate these teaching methods to the theoretical concepts recently discussed.

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Picture: Pixabay.com

Outdoor education/Uteskole/Udeskole

Fieldwork

Picture: Pixabay.com

School camp

Outdoor education centre

Excursion

Forest school

Picture: Pixabay.com

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NORD University

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Placebased teaching or a place to teach?

Picture: Trygve Skavhaug og Tove Anita Fiskum

Picture: Haakon Halberg

- Place-based benefits: concrete learning, realistic learning
- «Another place to teach» benefits: other boundaries, other affordances, physical activity, green and natural environment (Beames, Higgins and Nicol, 2011, Beames and Ross, 2010, Fiskum and Jacobsen, 2012, Fiskum, 2015).

Camp model vs. local environment model (Jordet, 2010).

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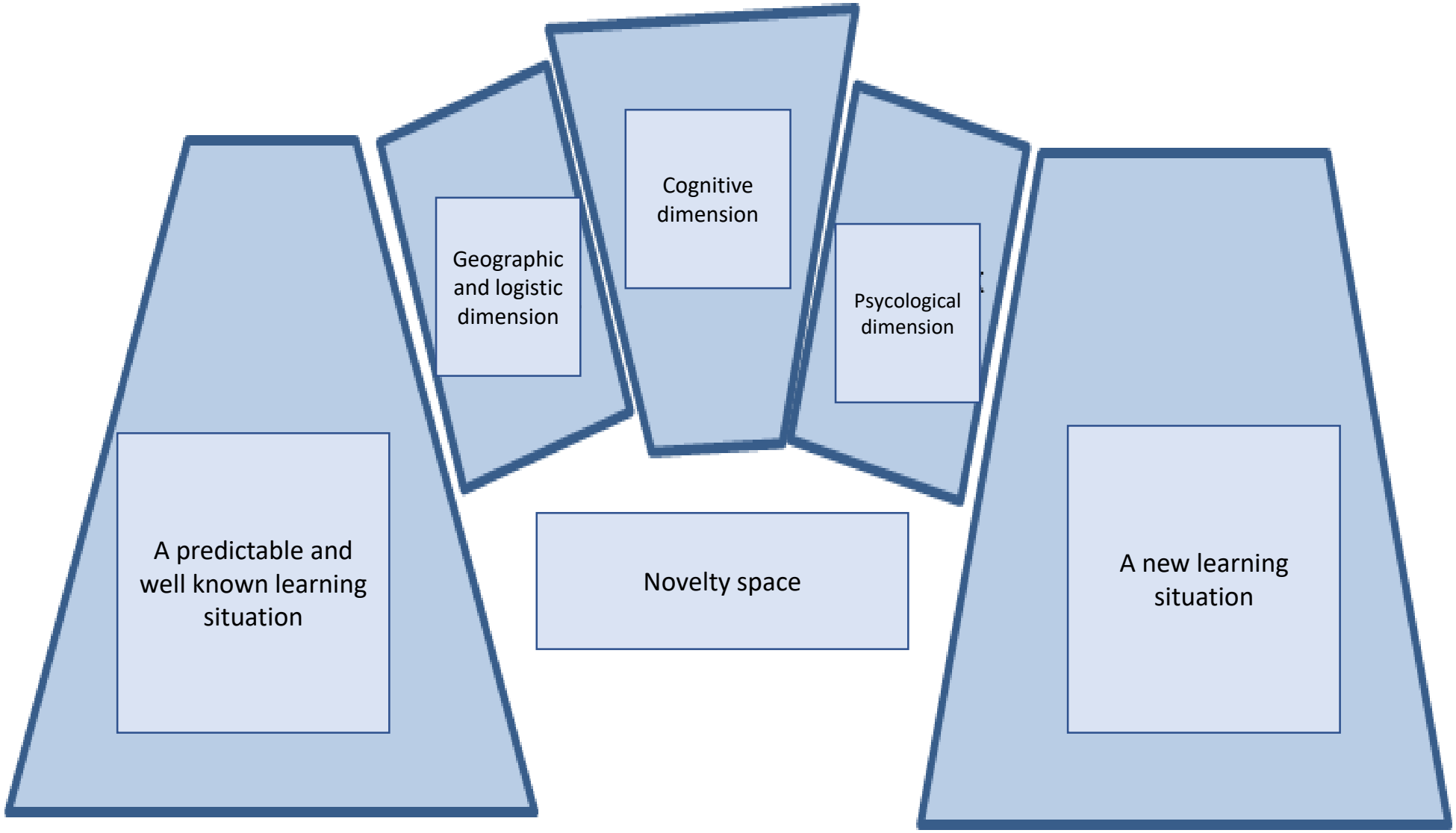

Erasmus Plus 21st Century Skills

Linking businesses to schools

Tuesday 26th March 2019

Today's session

By the end of this session, you will be able to:

- Identify the **value and importance** of employer encounters for young people
- Recognise what makes an encounter **meaningful**
- Identify **principles for effective** employer encounters

So, linking businesses to schools...why is this important?

Why is this important?

1. A young person who has **four or more encounters** with an employer is **86% less likely to be unemployed** or not in education or training, and can earn up to 18% more during their career.

Education and Employers Taskforce

Why is this important?

2. There is "a gap between education and the preparation people need for their future," as well as "a gap between the skills needed and those people have". **Employer encounters help address these gaps in skills and knowledge.**

CBI/Pearson Education

Why is this important?

3. **Social background** has a profound effect on progression in learning and work. Expanding employer encounters broadens students' horizons for action and fosters community cohesion.

King's College London

Why is this important?

4. Structuring employer encounters within the school curriculum **strengthens aspirations and attainment.** It supports students to take action to achieve their full potential.

Careers and Enterprise Company

Why is this important?

5. New jobs are emerging, many in growing sectors like digital technology. First-hand encounters expand a **student's understanding of areas of growth.**

Careers and Enterprise Company

Why is this important?

6. Jobs are under threat of automation over the next 2 decades. It is vital that students have first-hand contact with employers to help their **understanding of the skills needed for their futures.**

Bank of England

Why is this important?

7. There are significant ongoing weaknesses in the (STEM) talent-base, including under-representation of women and minority groups. Well-planned employer encounters can help **address imbalance**.

Careers and Enterprise Company

UK guidance

The Gatsby Benchmarks - a framework of 8 guidelines that define best careers provision in schools/colleges:

1 A STABLE CAREERS PROGRAMME	2 LEARNING FROM CAREER AND LABOUR MARKET INFORMATION	3 ADDRESSING THE NEEDS OF EACH PUPIL	4 LINKING CURRICULUM LEARNING TO CAREERS
5 ENCOUNTERS WITH EMPLOYERS AND EMPLOYEES	6 EXPERIENCES OF WORKPLACES	7 ENCOUNTERS WITH FURTHER AND HIGHER EDUCATION	8 PERSONAL GUIDANCE

UK Careers Strategy & Statutory Guidance

December 2017

- **Careers Strategy**: Making the most of everyone's skills and talents

January 2018 (updated in October 2018)

- Careers guidance & access **for education and training providers** – Statutory guidance for government bodies, school leaders & school staff
- Careers guidance - guide **for further education colleges and sixth form** colleges
- Destinations data – Good practice guide

Linking businesses to schools

What does good look like?

- Every student should have **multiple opportunities** to learn from employers about work, employment and the skills that are valued in the workplace
- Students should participate in at least one meaningful encounter with an employer every year **from the age of 11**
- Work with your **local authority** to make sure you are aligning to the strategic economic plan of the region

Gatsby Benchmark Toolkit guidance

What do we mean by a ‘meaningful’ encounter?

What it is:

- One in which the student has the opportunity to learn about what work is like or what it takes to be successful in the workplace (Gatsby Benchmarks, DfE)
- Links to other benchmarks e.g. #2 & #4

What it isn’t:

- A poorly planned, brief employer visit
- A one-off activity taking place in isolation

UK guidance

The Gatsby Benchmarks - a framework of 8 guidelines that define best careers provision in schools/colleges.

1 A STABLE CAREERS PROGRAMME	2 LEARNING FROM CAREER AND LABOUR MARKET INFORMATION	3 ADDRESSING THE NEEDS OF EACH PUPIL	4 LINKING CURRICULUM LEARNING TO CAREERS
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What it isn’t:

- A poorly planned, brief employer visit
- A one-off activity taking place in isolation

160

Principles of effective encounters

1. Clearly identified outcomes
2. Focus on learning
3. Delivered as part of a broader programme
4. A regular feature
5. Varied
6. Experiential
7. Designed and co-delivered with teaching staff
8. Students prepared
9. Differentiated and personalised
10. Feedback and assessment

Types of employer encounters

- Enterprise days
- Careers carousels ('speed networking')
- Careers fairs
- Careers talks
- Employer involvement in the curriculum
- Employer mentoring
- Transition skills workshops
- Interviewing a working family member or friend as homework

Types of employer encounters

With this in mind, let's hear from our employers and schools...

Guest speaker

Name: Stephen Blackmore

Job Title: Fuel & Driver Safety Management

Company: Turners (Soham) Ltd

How we currently work with schools/colleges:

- A total work experience
- Long term support linked to curriculum - Business studies GCSE
- Long term support - Foundation groups
- Mock interviews / CV workshops / Enterprise days / Mentoring All via 'Form the Future' partnership

Guest speaker

Name: Simon Humphrey
Job Title: Senior Sustainability Manager
Company: Arm Limited

How we currently work with schools:

- Arm Schools Programme
- Work Experience
- Career Ready
- Cambridge Launchpad
- Engineering Development Trust and Industrial Cadets
- Micro:Bit

Guest speaker

Name: Michael Evans
Job Title: Chief Executive Officer
Company: Cambridge Carbon Capture Ltd

How we currently work with schools:

- Work experience
- Enterprise Days
- Careers carousels

Guest speaker

Name: Heidi Mulvey
Job Title: Head of Community Engagement
Company: Cambridge University Press (CUP)

How we currently work with schools:

- World Book Day
- Work experience
- Onsite interview practice, CV workshops, Enterprise Days, careers carousels
- Reading practice

How CUP currently works with schools:

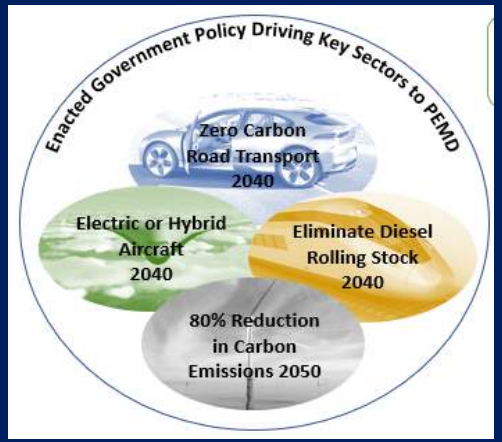
Guest speaker

Name: Stephen Riches

Job Title: Director

Company: Tribus-D Ltd

[Micro-SME developing solutions for miniaturising electronics in automotive and aerospace applications]



How we currently work with schools:

- Enterprise Days, What's my Line and Careers Carousel with Form the Future
- Enterprise Advisor for St Bede's School, Cambridge

Guest speaker

Name: Veronique Ivory-Johnson

Job Title: Teacher of English

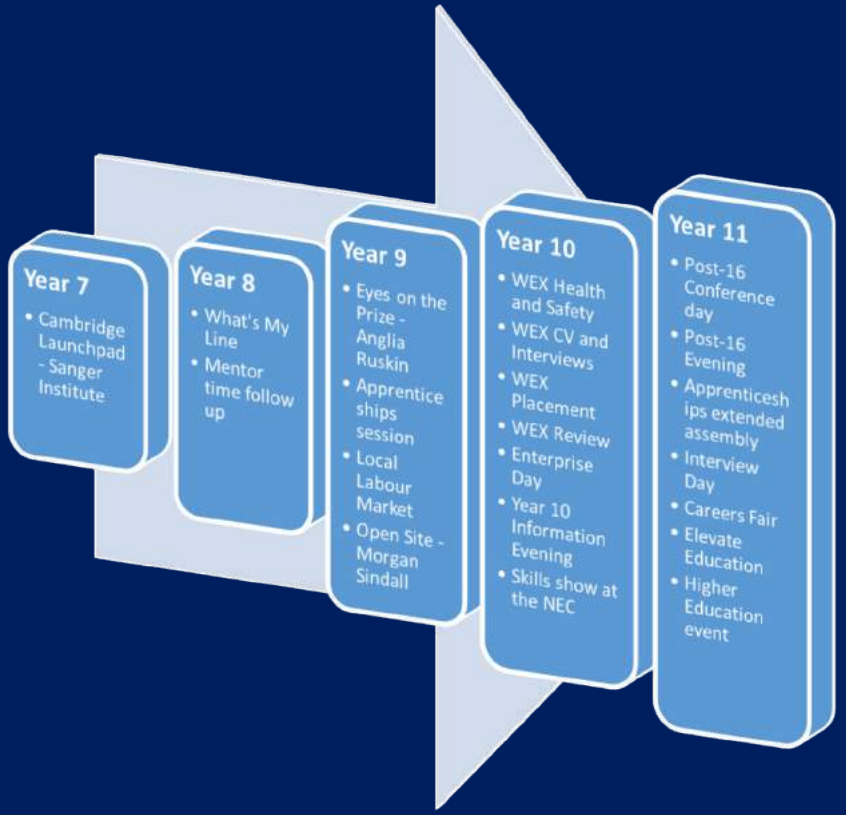
School: Sawston Village College (SVC)

How SVC currently work with employers:

- Sustained relationships with local employers e.g. Morgan Sindall, The Welding Institute
- Strong relationship with Form the Future for organising key events and forming relationships with employers
- High Quality Work Experience sits at the centre of sustained work related experiences for all pupils (we work with TEP – The Employability Partnership)
- Strong relationships with Post-16 and Higher Education providers

How SVC currently work with employers:

- All pupils follow our Careers Education, Information, Advice and Guidance (CEIAG) programme.
- Taught in dedicated CEIAG lessons, PSHE days, through assemblies, mentor periods and collapsed mornings.
- Employer engagement is a central part of the CEIAG programme throughout pupils' time at the college. There is an opportunity in all years for pupils to engage with employers, from Cambridge Launchpad in Year 7 to the multiple employer engagements in Year 11, such as the Careers Fair or Interview Day.
- **In 2018-19 so far over 100 employers have been involved in these events.**



Guest speaker

Name: Graham Oxborrow
Job Title: Director of Curriculum (Careers Leader)
School: Saffron Walden County High School (SWCHS)

How SWCHS currently works with employers

- Bi-annual **Careers Fair & Apprenticeship Information Evenings**
- **Subject-based employer inputs** e.g. Mott MacDonald & Stansted Airport 'Aerozone'
- **STEM inputs** to address gender bias in GCSE options
- Year 10 **'World of Work'**
- **Lunch-time drop-ins**
- **Advertising local training & apprenticeship opportunities** to students/parents
- **Year 12 Mock Interviews** by local Rotary Club
- **Form the Future events:** 'What's My Line,' Enterprise Days, Mock Interviews
- **Spreadsheet records encounters** as students move through school

How SWCHS currently works with employers:

2,500 people (students and parents) attended 2018 Careers Fair with over 80 employers/education providers present

Group exercise

In groups, discuss:

- ❑ What does your school **currently** do?
- ❑ What **challenges** do you face in involving employers in school activity?
- ❑ How could employers best contribute to **embedding** 21st Century Skills into the curriculum at **your** schools?

Panel Q&A

Take this unique opportunity to ask questions which will help inform employer engagement in your schools/colleges.

Panellists:

- ❑ Stephen Blackmore, *Fuel & Driver Safety Management*, Turners (Soham) Ltd
- ❑ Michael Evans, *Chief Executive Officer*, Cambridge Carbon Capture Ltd
- ❑ Simon Humphrey, *Senior Sustainability Manager*, Arm Limited
- ❑ Heidi Mulvey, *Head of Community Engagement*, Cambridge University Press
- ❑ Stephen Riches, *Director*, Tribus-D Ltd

Linking businesses to schools

In summary

- Employer engagement in schools/colleges is critical to young people **acquiring the necessary skills** for the future
- Schools, colleges and employers need to work together to provide **first-hand encounters** with employers as part of careers provision for **11-18 years olds**
- This Erasmus Plus programme provides the opportunity to learn and build upon your approach from peers – **use the network!**

Today's session

By the end of this session, you show now be able to:

- Identify the **value and importance** of employer encounters for young people
- Recognise what makes an encounter **meaningful**
- Identify **principles for effective** employer encounters

Thank you.

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TEACHING MATERIAL COURSE 2 DAY 3

- Lecture slides day 3
- Intermission work 2

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Course 2 – Day 3

Deep learning

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Developing transferable knowledge and skills in the 21st century

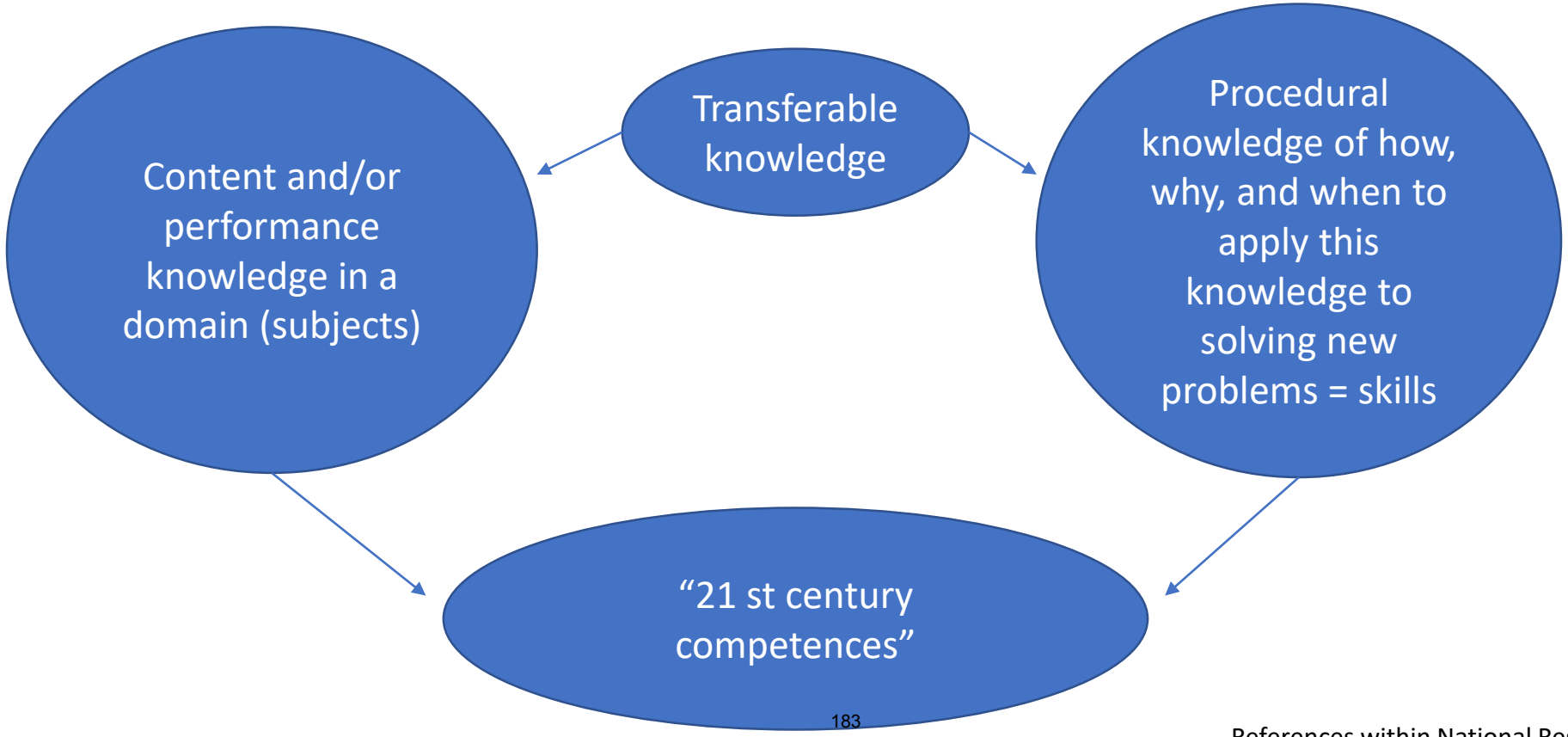
Two views of 21st century skills:

1. **Skills as general skills**
   - applied to a range of different tasks in various academic, civic, workplace, or family contexts.
2. **Skills as dimensions of expertise specific to- and intertwined with- knowledge within a particular domain of content and performance**
   - skills and knowledge are intertwined therefore use the concept competencies rather than skills.

References within National Research Council (2012).

Picture: Pixabay.com

- "Deeper learning": The process through which an individual becomes capable of taking what was learned in one situation and applying it to new situations → transfer
- Product of deeper learning: transferable knowledge



References within National Research Council, 2012

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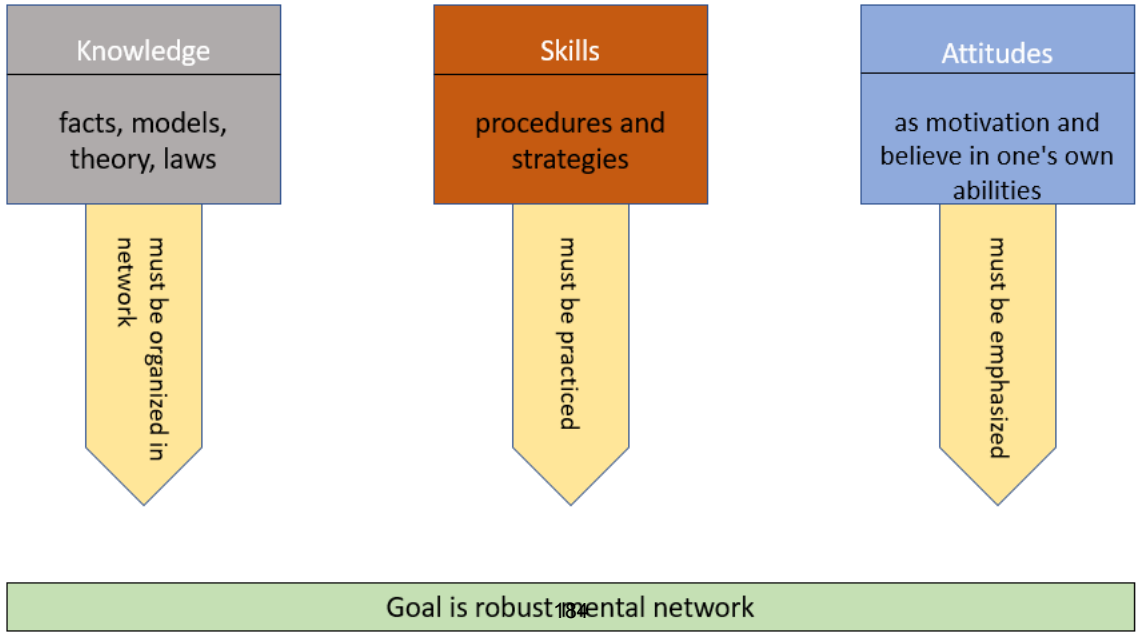
Modell for deeper learning

- Deeper learning is a process that means to organize knowledge in hierarchical structures around central ideas in subjects that emphasizes on general patterns, general principles and models
- Too be able to learn we need to experience meaning, control/mastery, and avoid mental over load.
- Example on how to model deeper learning as a process divided into knowledge, skills and attitudes



Mayer, 2011

Knowledge, cognitive and affective dimension

The Knowledge Dimension (The Noun)	The Cognitive Process Dimension (The Verb)					
	1: Remember	2: Understand	3: Apply	4: Analyse	5: Evaluate	6: Create
A: Factual Knowledge						
B: Conceptual Knowledge						
C: Procedural Knowledge						
D: Metacognitive Knowledge						

Affective Dimension

1.0 «Reception»

- 1.1 Awareness
- 1.2 Willingness to «reception»
- 1.3 Directed Attention

2.0 Responding

- 2.1 Compliance in responding
- 2.2 Willingness in responding
- 2.3 Satisfaction in responding

3.0 Valuation

- 3.1 Accepting of a value
- 3.2 Preference for a value
- 3.3 Convinced by a value

4.0 Organization

- 4.1 Form a notion of a value
- 4.2 Organizing a value system

5.0 Be characterized by a value or value system

- 5.1 Generalization
- 5.2 Characterization

(Krathwohl, 2002; Krathwohl, Bloom, & Masia, 1964)

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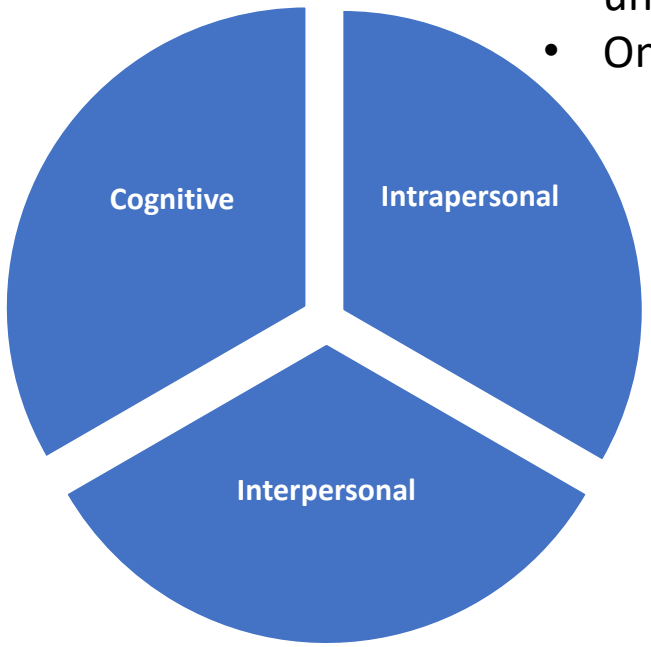
Deep learning as development of competences

- Takes time: a process not a product, both within each student and through social interaction

- Some characteristics on teaching giving DL.
  - Based on rich and relevant themes
  - Clear learning goals (especially in informal learning environments)
  - Students have many, and different opportunities of expressing their understanding
  - Ongoing assessments on what they are expressing



Subject specific knowledge and procedures

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3. Group work assignment

The Knowledge Dimension (The Noun)	The Cognitive Process Dimension (The Verb)					
	1: Remember	2: Understand	3: Apply	4: Analyse	5: Evaluate	6: Create
A: Factual Knowledge						
B: Conceptual Knowledge						
C: Procedural Knowledge						
D: Metacognitive Knowledge						

Kratwohl`s 2002

The 6 C`s

- Critical thinking
- Collaboration
- Communication
- Creativity
- Citizenship
- Character

- Work in groups.
- Look at the table above and discuss where the 6 C`s can be applied, both in general and in relation to a chosen task/your teaching resource from the intermission work.

UNGT ENTREPRENØRSKAP

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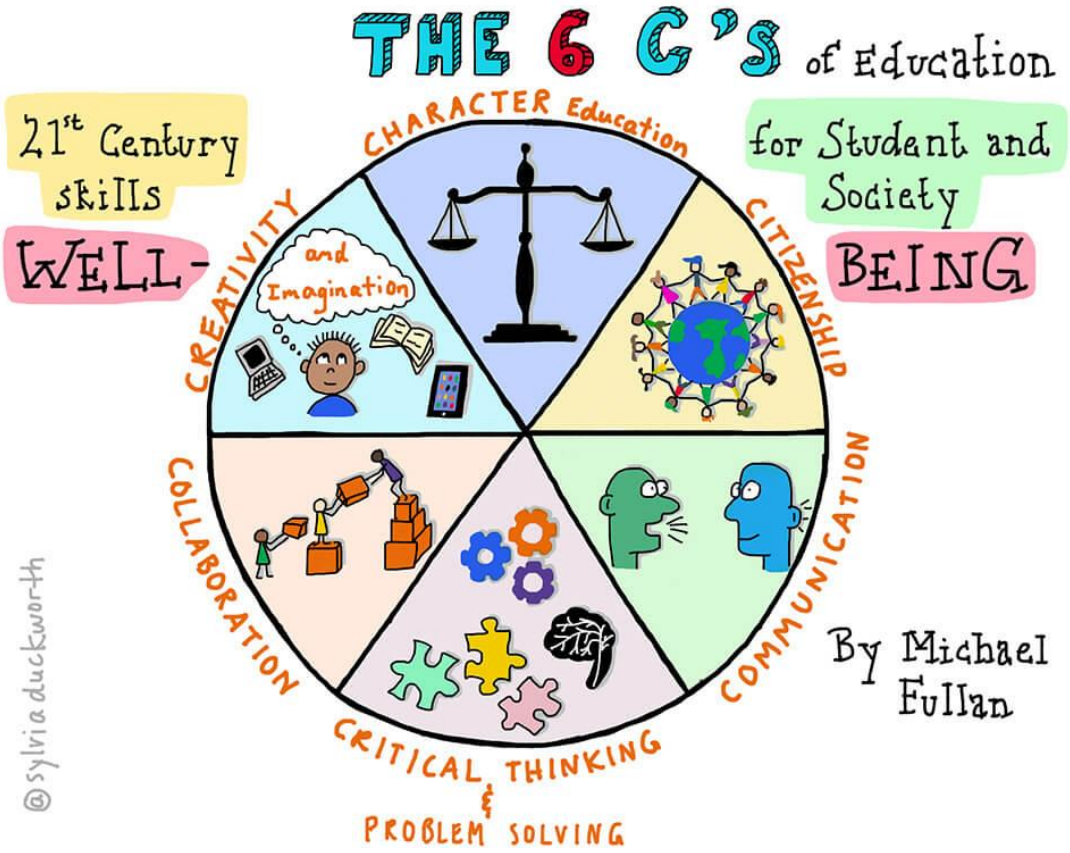
Intermission work 2

Between course 2 and 3

21st century skills

Appollo Institute 2020	OECD 2015	OECD 2020	NPDL/Fullan
1. Dissemination of meaning	1. Complex problem solving	1. Complex problem solving	1. Character
2. Social intelligence	2. Coordinating with others	2. Critical thinking	2. Citizenship
3. New and adaptive thinking	3. Leadership	3. Creativity	3. Communiation
4. Cross cultural compentence	4. Critical thinking	4. Leadership	4. Cooperation
5. Digital skills	5. Negotations	5. Coordinating with others	5. Critical thinking
6. Modern understanding of media	6. Quality control	6. Emotional intellingence	6. Creativity
7. Interdisciplinary	7. Service oriented	7. Judgement and decsision making	
8. Adaptive thinking	8. Judgement and decision making	8. Service oritented	
9. Management of cognitive load	9. Active leastening	9. Negotation	
10. Virtual collaboration	10. Creativity	10. Cognitive flexibility	

Our choice


THE 6 C'S of Education
21st Century skills
for Student and Society
WELL-BEING
CHARACTER Education
CITIZENSHIP
COMMUNICATION
CRITICAL THINKING & PROBLEM SOLVING
COLLABORATION
CREATIVITY and Imagination
By Michael Fullan
@sylvia duckworth

Intermission work

- Every group will have one given C
- Choose one of your finished lessons with your students and do it again – this time focus on your C
- Reflect on what happened:
  - How do you think your teaching resource, developed as part of the intermission work, lead to development of your C?
  - What parts of the teaching resource lead to development of your chosen C`s and why?
  - Did you experience that the student achieved the teaching goals as you worked with the C?
  - Were your students capable of taking what they learned in one situation and applying it to new situations (deep learning)?

Intermission work

- A special challenge to reflect more upon the 6C`s:
  - Have you experienced some teaching methods/ways of working at school which contribute in a positive way to develop one or more of the 6C`s?
  - Are there something you think we need to be aware of? Something that might decrease the development or lead to negative aspects of the skills?
- Make it international with the others in your group
- Is it possible to use some businesses?

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TEACHING MATERIAL COURSE 3 DAY 1

- Lecture slides day 1

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Course 3 – Day 1

Intermission work and reflections

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Phase 1: share experiences within each group

Discuss and present to each other within each group (C):

1. How did you implement the C in teaching and practical exercises?

2. In your teaching, have you gained any new knowledge in implementing 21st. century skills? If so, what?

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Phase 2: discussion in groups of implementation of the C.

As a group working with a common C:

Discuss as a group questions in phase 1 and additional questions given under phase 2 and make a presentation that summarizes this discussion. This presentation are to be presented in plenum.

Objective: increase the understanding of implementing this C in teaching and towards teaching of 21st. century skills.

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Phase 2: discussion in groups of implementation of the C.

Question to discuss:

1. As a group working with a C:

- Can you outline a common teaching approach?
- Can you find any common aspects across subjects and grades?
- How can this contribute to a higher understanding of implementing this C in teaching and learning?

2. Should implementation of the C be a method (teaching), or a theme and goal of teaching and learning, or both? (Explicit or implicit for the students.)

- Discuss and give arguments for or against these different approaches?

3. How can working with this C influence the understanding of teaching other Cs?

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Phase 2: discussion in groups of implementing the C.

Create a presentation that summarizes the discussion in the group. The presentation should be 5 minutes. **In addition, the group should present a problems/question/issue to be discussed in plenary.**

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Phase 3: understanding of 21st. century skills

Presentations of the groups (Cs) and plenary discussions

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Summary of the C`s.

1. Individually based on your subject and grades you teach:
- Rank the six C`s from most important to least important
- Rank the six C`s from easiest to hardest to implement in teaching and learning

You are given cards with the 6 C`s in the groups.

2. In groups discuss a common ranking of the C`s:
- Rank the six C`s from most important to least important
- Rank the six C`s from easiest to hardest to implement in teaching and learning

3. Summary discussion on plenum.

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TEACHING MATERIAL COURSE 3 DAY 2

- Dialogue cards

Skills cards for group work

Each group gets two sets of dialogue cards with the 6 Cs.

- Rank the 6C from most important to least important
- Rank the 6C from easiest to implement in teaching to most difficult to implement.

Creativity	**Collaboration**
Critical thinking	**Communication**
Citizenship	**Character**

Creativity	**Collaboration**
Critical thinking	**Communication**
Citizenship	**Character**

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TEACHING MATERIAL COURSE 3 DAY 3

- Dialogue assignment with socio-scientific issues

Dialogue assignment with socio-scientific issues

Divide the participants into groups of 5-6 people. Tell the story below.

The king loves the queen. She, on the other hand, has a lover - and this the king has discovered this. He tells her that he knows what's going on, but that he is willing to forget this if she never sees her lover again.

Soon after, the king is going on a travel. He tells the queen that she must not meet her lover, the punishment for it will be death.

But when the king has left, the lover calls and says that he has to see the queen this evening.

The queen goes to a guard she trusts and asks for help. The guard says he will arrange for her to go and return unseen. And the queen goes to her lover.

But the guard is replaced, and the queen is discovered on her return.

When the king finds out what happened, he orders a guard to kill her.

The groups are to discuss the following case:

Rank in order of priority who is most to blame in this story: the king, the queen, the guard or the lover.

It must be mentioned that the first guard has been checked out of the question of guilt. It is the guard who took the life of the queen who is to be ranked.

Who is most and least guilty of king, queen, lover and guard?

Source: https://blogg.forskning.no/nina-kristiansens-blogg/konge-dronning-elsker-vakt/1120594

PART 2: TOOL KIT– CASE STUDIES

INTRODUCTION TO TOOL KIT – CASE STUDIES

The intermission works of the participating teachers have been structured into case studies categorized by the 6 C's:

- Creativity
- Collaboration
- Citizenship
- Character
- Communication
- Critical thinking

Some of the case studies covers more than one C and will thus be categorized under all the relevant C's.

The format of several of the case studies is hard to capture in a pdf-file. The case studies will therefore be presented with a short introduction and a link to the complete case study on the web page.

There is a total of 25 case studies from all the participating countries:

UK, Denmark, Romania and Norway.

The case studies are meant to be an inspiration to teachers all over Europe and world-wide. They will of course need to be adapted to the relevant subject, age group and national context.

We hope you will find some useful tools to explore the teaching of 21st century skills.

CASE STUDIES

The world of advertising

Category: Creativity, Critical thinking

Advertising is a part of the students' syllabus, and they meet it every day in TV and radio. They must know how it works, what kind of tools they use and how advertising influences our choices and our lives.

The task is for a group of students to make and then film their own advert.

https://www.21cskills21cneeds.com/case-studies/intermission-work-the-world-of-advertising

Teaching the conspiracies

Category: Critical thinking

Conspiracy theories are becoming increasingly important to understand today. With information overload and fake news spreading quickly it is important for the students to train their critical thinking.

The task is discussion-based and use both pictures and movies to trigger the discussions.

https://www.21cskills21cneeds.com/case-studies/intermission-work-teaching-the-conspiracies-norway

Plastic waste in the ocean

Category: Citizenship, Creativity, Collaboration

Plastic waste in the ocean is a huge environmental challenge world-wide. To increase the awareness of this issue among young people is therefore important.

The task is to collect waste and make an art exhibition.

https://www.21cskills21cneeds.com/case-studies/uols47i2lxk73r6bmsml12jnjy8ujg

Plastic pollution

Category: Citizenship, Communication, Collaboration

Environmental and climate challenges call for more research on the effects of for example plastic pollution and call for new solutions to our world-wide problems.

The task is for a group of students to do research and make a presentation on a question within the topic plastic pollution.

https://www.21cskills21cneeds.com/case-studies/n97rlll982ys3y9jb2qba8u7r7ggtu

Mindsets

Category: Character, Critical thinking, Citizenship

The aim of this case study is to get students reflect on how they learn, to understand themselves better and how we are influenced by others. Growth and fixed mindsets are key words in this case study.

The task is based on discussions of different issues and a writing session.

https://www.21cskills21cneeds.com/case-studies/auvbmy5tf5newm266e4kf320qlgs8o

Garbage in our community

Category: Citizenship, collaboration, creativity

The case study focuses on garbage in the local community, and how the community deals with it. The thought is to have some knowledge about something that is close to you before expanding your knowledge on a global problem.

https://www.21cskills21cneeds.com/case-studies/9j43qhkcwwssxzxpe179vbfekw9hp7

Fairytale

Category: Creativity

Fairytales often appear in different cultures, but with a slightly different angle or context. Most fairytales takes place in the old days but is still relevant for us today. This case study uses the old fairytales to tell stories of the modern world.

The task is for a group of students to rewrite an old fairytale and present it to the class in a chosen way.

https://www.21cskills21cneeds.com/case-studies/4tpnizw3t354t3msubieryb184oh82

Deep learning of lime

Category: Critical thinking, Citizenship

The aim of this case study is to get the students to reflect on a topic and see different perspectives and solutions. The topic chosen is the mineral lime, as this is an important mineral in the world and to the local society of these students due to a local company.

The task is to study the topic of lime over a period of time and from different angles.

https://www.21cskills21cneeds.com/case-studies/kc34q9l821jba1my2albio3k05j54p

Communicating through music

Category: Communication

Music is full of communication. It is the communication between the musicians, and it is the communication between the musicians and the audience. Music can be used to communicate a message and a feeling.

The task is to play a chosen song with communication between the students being in focus, rather than mastering the instruments.

https://www.21cskills21cneeds.com/case-studies/intermission-work-communicating-through-music-norway

Charlie on a trip

Category: Collaboration

Collaboration is an important skill to master in the 21st century. Collaboration requires practice, even from an early age.

The task of this case study is to use small assignments for students to solve together and to afterwards reflect on how they have to collaborate underway.

https://www.21cskills21cneeds.com/case-studies/8k0wpoj4h39ws6mk0zwo44t7twwny8

Biomass for the future

Category: Citizenship

Citizenship is something we need to focus on in school, particularly when society has become more and more polarized and individualized. A sense of belonging and a feeling of taking responsibility for more than oneself can contribute to the student's self-esteem and accomplishment.

The task involves a visit to a local company and group work on a chosen assignment related to biomass.

https://www.21cskills21cneeds.com/case-studies/yz5bcgq20rowsaxwdsbomi3j04zcbx

Plastic in the ocean 2

Category: Character, Citizenship, Collaboration, Communication, Creativity

Even for countries far away from the ocean, the problem of plastic in the ocean is relevant and important. Through focusing on this topic, the different C's can be trained in different ways.

The task is done through discussions and field trips.

https://www.21cskills21cneeds.com/case-studies/lkauruj9e4wmyl9bm9n92yi3nlfypn

Philosophical timeline

Category: Character

This case study aimes to make a philosophical timeline with students in two different countries and then share information and reflection online in a virtual classroom.

The task of making a philosophical timeline is done through both individual and group work.

https://www.21cskills21cneeds.com/case-studies/7g1mzimnrtko9dau7vndx24vzibkfh

Connectedness

Category: Citizenship, Creativity, Critical thinking

Through the themes of schoolwork, interactive life and the world of the future, the aim is to raise awareness regarding the responsibilities the students have in connection to education, the use of technology and the development of various fields of study.

https://www.21cskills21cneeds.com/case-studies/3znwn51qh18hj3zz5fgd1mo18i5l9w

Advertising philosophy/arts

Category: Citizenship, Creativity, Critical thinking, Communication, Collaboration, Character

This case study involves all the 6 C's in different ways.

The task is to choose between making an advertisement for an airline of Philosophy OR advertisement for an airline of Art. The choice can be anything that requires the student to choose between working on something familiar og unknown.

https://www.21cskills21cneeds.com/case-studies/2xshv0wuv5o9s2qlyloraz8sh942nk

The 6 C's and sport

Category: Citizenship, Creativity, Critical thinking, Communication, Collaboration

This case study links sports to very concrete situations and real-life experiences. The reflection on the activities might succeed to a level where the young people see their individual impact as citizens on social transformation.

https://www.21cskills21cneeds.com/case-studies/3uq5ac32dijg1cxeyyq09qi6rq5dxi

Upcycling

Category: Critical thinking

The case study is inspired by the makerspace idea and FAB lab. The students choose a used item that is causing a problem, locally or globally, and changing it into something useful, that must to contain two functions. One example can be plastic. It is a material that causes problems, but it can at the same time be made into something useful.

https://www.21cskills21cneeds.com/case-studies/f5gf8imb3g6ndcyfy0k1lozf9tt9j7

Statistics in the context of critical thinking

Category: Critical thinking

Statistics can be used both in an informative way and to manipulate. This case study aims to teach the students to read statistics with a critical view, so that they can question the way statistics is used in society.

https://www.21cskills21cneeds.com/case-studies/urbzx2sd0uy36bx5i4x2acdo8v54r7

Plastic in the ocean 3

Category: Citizenship, Creativity, Critical thinking, Communication, Collaboration, Character

This case study captures a highly relevant topic – plastic waste in the ocean. The study involves cooperation with a company, Lego. The case study uses the Design Circle as a didactic framework when working on a specific task.

The task was to create a campaign to raise awareness on plastic waste in the ocean.

https://www.21cskills21cneeds.com/case-studies/9vx9sh5kt12pquns8ciiw6ekloirag

Housing for future generations

Category: Creativity, Communication, Critical Thinking.

The focus of this case study is to get the student to solve a real-life problem with a local company.

The task is to find out how a housing company can attract the future generations looking for a home. The assignment is done in groups and presented to the company involved.

https://www.21cskills21cneeds.com/case-studies/booe4ws7mmc8n8y7j2h2ujv8jaetif

Future classroom

Category: Citizenship, Creativity, Critical thinking, Communication, Collaboration, Character

This case study challenges the students to think of new solutions and new ways of thinking, by working on a specific case.

The task is to create a model of the "future classroom". This is done in groups followed by a presentation. The presentation can be done in a different language, thus giving the opportunity to do class twinning on the assignment.

https://www.21cskills21cneeds.com/case-studies/ifichbz2pq80wgs85bcuo5244xv8m4

Drinking water

Category: Critical thinking

Clean drinking water is a scarcity in the world today and raising the awareness of the importance of drinking water among young people is essential. This case study has two parts where one is a discussion-based part while the other part has a research approach.

https://www.21cskills21cneeds.com/case-studies/idzz9gitcne45hf363zzcizlrlb9ca

Character building

Category: Character

This case study experiments with peer to peer grading to build character. The students are given an assignment, but instead of the teacher grading the assignment they have to grade each other's work. This is done in different ways and aims to change the focus of the students from grades to feedback.

https://www.21cskills21cneeds.com/case-studies/0ghxi7u68zwedpesyqa4flbwzhflq3

Potable Water: What Is It and Why Is It Important?

Category: Citizenship, Collaboration

In this case study the students are introduced to the concept of sustainability in water purification and taught an awareness of finite resources and how precious safe drinking water is.

The task is to find examples from around the world of their struggles to obtain safe and clean drinking water and use them as basis for group discussions and later to do a practical experiment of purifying water.

https://www.21cskills21cneeds.com/case-studies/potable-water

Chemistry Study Pack

Category: Character

This case study has the bases in the challenges of students leaving school deficient in character-based skills such as independence, resilience and self-reflection, and at the same time teachers being overloaded in marking assignments.

The task is to make the students grade their own work.

https://www.21cskills21cneeds.com/case-studies/chemistry-study-pack

MORE INFORMATION

For more resources and information on 21st century skills in general and the project 21st Century Skills for 21st Century needs in particular, please visit the website:

https://www.21cskills21cneeds.com/

and Facebook:

https://www.facebook.com/21st-Century-Skills-for-21st-Century-Needs-2201848770138976