

Inquiry Based Learning: Write A Science Opera

ONLINE GUIDEBOOK

Content

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Introduction

Write a Science Opera (WASO) is a trans-disciplinary, inquiry-based approach to teaching at the intersection of art and science in schools. In this online manual, we provide a step-by-step description for how teachers may implement WASO with their pupils. This is challenging, but the rewards are endless, robust and powerful.

The first three chapters contain information about what WASO is, and how it may be implemented with various school disciplines. In chapter 4 you will find physical and vocal warm-ups. Chapters 5 and 6 contain the actual steps which the pupils will undergo during WASO. Finally, chapter 7 describes approaches to WASO's evaluation. An extended version of this manual with a broader collection of examples is available in the printed guidebook, "Trans-disciplinary Inquiry-Based Learning: Write a Science Opera".

We are delighted that you are joining us, and look forward to hearing about your experiences so that we can learn from you as you have hopefully learned from us.

Good luck with WASO!

Oded Ben-Horin and Irma Smegen

1. Trans-disciplinary Inquiry Based Learning

Children are curious by nature and like to investigate the world surrounding them. Curious children are willing to learn: they want to find solutions, reasons or answers. They will ask questions and pursue their potential discoveries. Creating a science opera will spark their curiosity and encourage them to investigate within both art and science.

The aim of Inquiry Based Learning is both the collection of knowledge and the formation of good habits of learning. It may support children's development of a large variety of competencies related to the way researchers work¹.

There are many ways to conceptualize Inquiry Based Learning (IBL). At the core of them all lies a basic foundation of pupils' curiosity, and the notion that it is that curiosity which drives the pupil's learning. Our claim for a *trans-disciplinary* IBL lies in the fact that we are aiming for an inquiry-based process in both science and the arts. The specific details of what we imply are put forth in the pages below.

In each WASO project, a scientific or technological theme are chosen as a starting point for the opera. This educational form can be implemented in schools in a variety of ways. For instance:

- as a way to introduce or expand a school-subject;
- as a way help make a subject more memorable for pupils;
- as a way of replacing more traditional ways of teaching.

We understand the creation of an opera as a form of investigation in which designing happens in many ways. Pupils research the subject of the performance, their roles, the story line, the emotions as expressed between opera characters, the songs and music, why the story turns out the way it does, how the text is best presented, how music can enhance this, etc. Children often enjoy creating these performances. They collaborate, need each other, investigate their own qualities and those of others, further develop these, utilise each other's knowledge and skills, and create a complete opera production together. In addition, an opera connects all aspects of arts: visual, music, drama and dance, which provides ample space for children's creativity to unfold.

¹ Van Graft e.a., 2007

2. Write A Science Opera (WASO)

Write A Science Opera (WASO) is a multidisciplinary approach to develop and perform an opera with children. It is an Inquiry Based method for art and science education, developed by author 2 of this book: Oded Ben-Horin. Ben-Horin is a musician and Associate Professor of music, and was inspired by the Write An Opera method developed by the Metropolitan Opera of New York, and connected it with Science and Technology.

This manual describes the different steps of WASO, with additions and possible variations. The following chapter will provide further information about Write A Science Opera with pupils. They must understand abstract ideas and principles across disciplinary boundaries, such as:

- What style of music best fits an opera about the solar system?
- What kind of dramatic dialogue should emerge between characters representing electrons and protons?
- How does the creation of a painting of the ocean impact our questions about the ocean?

These questions are typical of the kind of challenges which arise in WASO. WASO is thus an approach to teaching in which children are invited to take responsibility for their own inquiry, and for the creation of the educational content being explored. WASO is a way of granting children *ownership* over their own learning process.

WASO projects have produced science operas inspired by a variety of scientific subjects, for example:

- the human body in Portugal,
- the chemistry of diamonds in Belgium,
- the Northern Lights in Norway,
- the sense of vision in Scotland,
- supernovae in Australia,
- particle physics in Greece.

How much time does it take?

It is possible to implement a satisfying WASO project with various lengths of time. A typical project lasts for 1-2 weeks, but it is possible to implement some basic exercises which require one hour and a half. Indeed, some groups decide to work for an entire year. In chapter five you will find an overview of the steps taken in WASO including how much time each step will take.

Can all children join?

Yes. All children can join. WASO has been implemented at many schools and with a diversity of groups, including with children and students with special needs. Cooperation is an important part of the WASO process and children typically help each other. During the project there are several tasks, so each child can do something which is achievable or fits best, also when circumstances change or when there are limitations.

An example of a Write A Science Opera project

Curso de Música Silva Monteiro in Porto (Portugal) coordinated a WASO project with 96 children (ages 10 to 14). They simultaneously created four different operas with the same theme: 'Earth: A living planet'. During weekly session over a duration of five months, the pupils developed and improved their operas during their music classes under supervision of music teachers and primary school teachers. When needed, they were provided assistance from science and theatre teachers. Finally, the pupils proudly presented their final performances at the Casa da Musica concert hall in Porto.



3. Connections with Other Subject Fields

While the main focus in WASO is on art and science, this learning approach naturally lends itself to the incorporation of other subject fields as well. These could be languages (for example during the creation of opera librettos), math, history, geography, etc. Each WASO project will therefore have different learning objectives. As a teacher, you can choose to emphasise more of one subject field than another:

- If you ask the children to incorporate at least ten sayings in the performance, more attention will be given to this element of language education.
- If the theme of the opera is 'the steam train', you can imagine children will learn more about technology.
- If the opera's story-line is about previous scientific discoveries, history will be a main factor in the process.

Often, during the learning objective's focus may shift to entirely different directions than those typically chosen during arts education processes. This occurs due to the need to collect new information regarding the opera's scientific theme.

Furthermore, in WASO pupils typically learn from each other. Provided with enough space to share their experiences, an exchange and cross-fertilization of acquired knowledge and experiences often takes place.

Let's go!

4. Warming up

Carpenters have certain tools they use, and so do people playing in an opera: their own body and voice are their tools. In order to properly develop and use those tools, actors, dancers, singers and musicians need to warm up. Their body, voice and instruments have to be prepared to function properly. A warm-up session also gets everyone focused. This is not only necessary before each performance, but also before each rehearsal.

Here we will give examples of exercises that can be carried out with your group. In the WASO guidebook, you will find many more examples.

Body

Loosening up

All ages 10 minutes

Stand straight with your feet slightly apart. Imagine that a string is attached to the top of your head, and that it is pulling you up.

- Let your head gently drop forward and make small turns with your head. Also turn to the other side. Now pull your head up.
- Roll your eyes: look up, to the right, down, to the left. Make silly faces: press your eyes and mouth as close as possible and then open them as wide as possible. Repeat this several times.
- Pull up your shoulders, move them backwards, let them drop and turn to the front. Do this a few times, both to the front and backwards. Relax your shoulders.
- Move your hands in circular movements, and move your forearms as well, so as to move your elbows. Turn in both directions.
- Do the same with only your hands, to loosen your wrists.
- Move your fingers in a way that simulates playing the piano.
- Put your hands on your hips. Pull your chest up and your shoulders back. Move your upper body to the right. Your hips need to stay in place. Move your shoulders forward and your upper body backwards, as if being hit in the stomach, then move to the left and again to the front. You are now making turns with your upper body, to both sides.
- Put your hands on your lower ribs. Keep your upper body still and move your hips. Move your bottom backwards, then left (bend the left knee), forward, to the right (bend the right knee). Turn in both directions. At a certain point you can start making larger movements by moving your upper body as well.
- Stand on one leg. Choose a point on the horizon to focus on. For younger children, this may be a stuffed toy placed at eye level. Lift your leg and keep your thigh in a horizontal position. Make circles with your lower leg in order to warm up your knee.

- Hold that position and now make circles with your foot in order to warm up your ankle.
- Switch legs and repeat.

Voice

Echo well

All ages 10 minutes

The group stands in a circle. Imagine that there is a well in the middle of the circle. The teacher starts by saying, yelling or singing something. The group echoes as accurately as possible. Repeat this several times. Now it is the children's turn. Ask them to decide (individually) what they will say or sing (this can be a word, or even jibber-jabber, another language, or a sound). Indicate who will start and in what direction. All sounds are echoed by the entire group. You can give the children inspiration for variation by telling them that they can switch between hard, soft, high, low, slow and fast.

Acting

Greeting

All ages 10 minutes

Each pupil chooses one one of the opera's characters (several pupils may choose the same character). Ask the pupils to walk around in the room while mimicking that character's way of movement. When two of the pupils meet each other, they must greet each other as the characters would. Following this, experiment with different ways of greeting that fit this role (e.g. loudly, shyly, different accents). Eventually, the entire group plays one of the opera's character, following the same assignment.

Orchestra director

All ages 10 minutes

Everyone is in a circle. One child leaves the classroom for a moment. Pick one child to be the "opera director". This child starts to pantomime playing an instrument (for example a guitar, drums, etc.). All other kids start pantomiming as if they play that same instrument as well. The child who was asked to step outside is invited to return. S/he stands in the middle of the circle while everybody keeps playing. The director can change instrument and everyone in the circle changes as well, correspondingly. The child in the middle tries to figure out who is the director.

Concentration

1, 2, 3

6+

5 minutes

Work in pairs. One child starts by saying 'One' and the next child says 'Two', and then the first one says 'Three'. It starts over and now the other child starts. This goes on for a while. Try finding a rhythm. If this works well, the 'two' can be replaced by a jump in the air. If this works well, add a clap of the hands to 'one' and if this works well too, 'three' can be replaced by whistling. The counting can be left out. Variations are possible using different movements or sounds.

Freezing

All ages

5 minutes

All children walk through the space, choose a direction and walk at a slightly swifter pace than normal. It is important that everyone keeps moving. This is done individually, so no one touches anyone. Agree on a sound to which everyone halts and 'freezes' (this is a term often used in theatre terminology). You could use a drum or clap your hands for this. The next time they hear that same sound, everyone starts moving again.

Variation: Turn the music on. Everyone walks or dances to the music. As soon as the music stops, everyone freezes. Once the music is switched on again, you can move again.

5. Write A Science Opera in 13 to 15 steps

with children who can read and write

Creating an opera using the steps described in this manual can take as little as an hour and a half. After one hour and a half, expect the performance to last no more than a few minutes and be partly improvised. Of course, it is also possible to invest more time. Once step 14 has been reached, there is no maximum time to the process. Some groups spend a year working on their opera performance.

These steps are written to guide and inspire. No opera and no process is the same. Feel free to add and skip steps or change the order.

For the first steps used in this method, speed is essential. They should be realized rather quickly (a limited time frame can encourage better ideas). The following overview shows the steps involved, as well as the minimum and maximum time needed and the time distribution.

Step	Content	Minimum time needed	Maximum time needed
1	Pick a scientific subject	5 minutes	1 hour
2	Introduce the subject	5 minutes	1 week
3	Select interesting elements from this subject	5 minutes	10 minutes
4	Pick one element and write down or draw everything you know about it.	10 minutes	15 minutes
5	Think of questions about this element.	5 minutes	10 minutes
6	Choose one question and create a story about it.	10 minutes	15 minutes
7	Read the outline, find a title and imagine characters.	Can be left out	15 minutes
8	Rehearsal: tell the story and make tableaux living statues?	10 minutes	15 minutes
9	Presentations	2 to 3 minutes for each group = 15 minutes for five groups	5 minutes for each group = 25 minutes for five groups
10	Voting	5 minutes	5 minutes
11	Develop the characters	Can be left out	20 minutes
12	Role interview	Can be left out	60 minutes
13	Distribute the tasks	5 minutes	15 minutes
14	Everyone fulfils his or her own task for the performance	15 minutes	No maximum time

15	Performance	5 minutes	2 hours
	Total time spent	One hour and a half	To be decided

During the entire process, the subject needs to be kept in mind. Often, more information will be needed than what the children already know. Since there is a scientific subject, it is important to bear this in mind in order to prevent turning science into science fiction. The facts need to be correct, so often more investigation and research will be needed during the process.

One of the goals is always to transfer knowledge to the audience. The audience is not only watching an opera, but also learning about a certain scientific subject.

Step 1: Pick a scientific subject

This could be any scientific subject you want to tackle that either matches the interests and experiences of the children or that is aligned with the school programme. It could also be a subject the children are struggling with, in which case this form of creating an opera can be used as remedial teaching: repeating and expanding the subject matter.

If you do not have a lot of time to create the opera, a less comprehensive (and more specific) subject should be picked. If you have an extensive amount of time, a more comprehensive subject can be used. The children can also suggest a scientific subject themselves.

Step 2: Introduce the subject

This can be done in multiple ways. Here are a couple of examples:

Let's go:

- Go and visit places with the children. Go to the park or the forest, visit a museum, a bakery, a local artist, go ice-skating, visit an apartment if most children live in houses or a house if most children live in an apartment, attend a concert...

In the classroom:

- Introduce it in the usual way as described in the teaching method.
- Invite an expert, a father, mother, local, or acquaintance. Ask this guest to tell the children about the subject and possibly bring props to show and clarify. In some cases, the teacher or pupil can also be the expert.
- Tell a story, read a (picture) book about the subject.
- Watch a movie about the subject.
- 1st - 6th grade: ask a pupil or a few children to inform themselves about the subject and present it to the others. This could also happen through a working method that is already being applied, such as a speech, book presentation or news circle.

- Ask the library for relevant literature about the subject and have the class study the books and find information on the internet. If necessary, the class can be divided into smaller groups. Each group studies a subtheme.
- Start by using the knowledge the children already have. Sometimes combining all knowledge that is present in the group can add up to a lot of information! After this, it is possible to start with a round table in which groups make mind maps. Step 4 describes how this is done.

In the next step, the pupils work in smaller groups (between three and six pupils in each). The groups do not need to be of the same size.

Each group will receive:

- a large sheet of paper (at least size A3)
- markers/pens and other drawing materials

As soon as an assignment has been completed, the sheet is handed to the next group. (We encourage allowing the pupils to always use the sheets created by *other* groups in order to allow for a more distributed creative process to emerge). Move in the same direction and keep blank sheets at hand for when sheets are full.

Step 3: Choose the elements of the subject

Choose the elements you find interesting. Write and/or draw the sub themes on top of the sheet.

(Hand the sheet to the next group or move with you group to the next sheet.)

Step 4: Pick one of the subthemes

Make a choice with the group. Your choice might have different reasons; you could find the subtheme funny, interesting, silly or amazing. Try not to think about it for too long. If you do not reach a decision together, vote.

Circle this subtheme and write and draw as much as possible about this subject. Write down everything everyone in your group knows about it. In doing so, the subtheme becomes the new subject. (You may even choose to use a word web or mind map).

(Hand the sheet over to the next group or move with your group to the next sheet.)

Step 5: Think of questions related to this theme

Encourage the pupils to generate questions about the scientific subject-matter. Remember: there are no 'wrong' questions. Write them all on the sheet and ask the pupils to create drawings inspired by the questions.

(Hand the sheet over to the next group or move with your group to the next sheet.)

Step 6: Choose one of the questions and write a story around it

This is the first step in creating the actual opera. This description gives a clear overview of the storyline. It is a summary of the content, and does not contain dialogues. In an opera this is called the *synopsis*.

The synopsis describes

- what happens in the opera (the main storyline),
- who are the main characters (you might give a maximum number of characters (5-6?))?

During this step it might be needed and useful to give time for (scientific) research and find out more about the subject.

(Hand the sheet over to the next group or move with your group to the next sheet.)

Step 7: Find a title and describe the characters

Read the synopsis and find a title for the story. Describe the details regarding each of the opera's characters (age, gender, hobbies, favorite music, food, job, etc.).

Note: In theatre and opera everything is possible, so think of animals and inanimate things for roles as well.

You can also draw or glue cut-out pictures on the paper. What do the characters look like?

(Hand the sheet over to the next group or move with your group to the next sheet.)

Step 8: Tell the story and make tableaux vivants

Read the synopsis and role descriptions. Practise telling the story and make a couple of tableaux vivants, for example at the beginning, middle and end of the story. A tableau vivant is a still image formed with several persons. Trees, objects or buildings can also be made by means of a tableau vivant.

There could be a narrator and the others in the group could make the image, or everyone could narrate part of the story and they could all participate in the tableaux. If the group is not familiar with tableau vivant yet, begin by practising and creating some examples.

The aim of this step is to start thinking about what the three most important parts of the story are. The tableaux could be used in the performance, but this is not necessary.

Step 9: All groups tell the story and show tableaux vivants

Always start with the group's suggestion for an opera's title. Make sure to remember all the stories presented, because once everyone has presented, one of the stories needs to be voted for.

Step 10: Vote

Everyone closes their eyes. It is important that all eyes are closed, so no-one can be influenced by their peers. Everyone can cast one vote.

TIP: Write the titles on the board, read them out loud and write the number of votes next to the titles. In case of a draw, you can choose to decide yourself (of course without sharing your personal choice with the group).

After the poll, everyone opens their eyes and the synopsis which will be turned into an opera is made known.

Step 11: Develop the characters

Material: Large sheets of paper, thick markers and scissors

Decide how many main roles will exist in the performance. Explain to the pupils that the ones playing a main role are not providing a more important part of the WASO process: everyone is equally involved. Children playing a minor role can take on other tasks.

If five characters are chosen, five children lie down on a large sheet of paper. A roll of wallpaper works well. Other children will draw the silhouettes of the children that are lying down. As soon as this is done, they can be cut out. Place the silhouettes next to one another with enough space to walk around them.

Write the name of a character on each of the cut outs. Descriptions are also fine (the fairy, the boy, ...)

Divide the children into smaller groups, with a group for each silhouette. During the next steps each group will move to the next character after each question.

The following steps don't have a fixed order. Furthermore, it is also possible to add other tasks or leave some out.

- I. Is the character a female or male? Mark with the symbols.
(Go to the next character, read what is written and look at what is drawn.)
- II. Think of two positive features of this character and write them down.
(Go to the next character, read what is written and look at what is drawn.)
- III. Think of one negative feature of this character and write it down in a different colour.
(Go to the next character, read what is written and look at what is drawn.)
- IV. Make two slits in the sides of the body to fold a flap. Write a secret of this character on the back and fold the flap over.
(Go to the next character, read what is written and look at what is drawn.)
- V. Give the character a name.
(Go to the next character, read what is written and look at what is drawn.)
- VI. Write a costume element in the character. It can be a main color or a style.
(Go to the next character, read what is written and look at what is drawn.)
- VII. Write which music fits with this character, write it in the body. It can be the name of a song, it can be a music style, a sound, or anything you can think of.
(Go to the next character, read what is written and look at what is drawn.)

VIII. Think of a profession for this character and describe some of his or her daily activities.

The development of the characters can be short, or a lot of time could be invested.

After this, everyone walks around and looks at the characters. Hang the characters on a wall to make them permanently visible for everyone.

Step 12: Role interview

Ask one pupil to take a seat in front of the group. The pupil will play a role. Pick one of the opera's character. All the other children function interviewers. The child that is being interviewed, invents answers on the spot to the questions asked. Have the children come up with their own questions. They could write them down, as a real journalist would do. The goal of this interview is to develop the character and provide inspiration; the children get to know the characters and invent features.

Step 13: Distribute the tasks

Everyone knows what the storyline and the characters look like, so we are ready to prepare the performance. Firstly, tasks need to be chosen. Think about which tasks you need. Direction, music and stage are always needed in an opera. Other elements can be added or left out, depending on the size of the group and the time needed to create the performance. You can decide for yourself how many children will complete a task (sometimes one pupil can handle two tasks).

Element	Who gets which tasks?
Directing	The director will direct the performance. S/he says what the actors are to do and decides what the performance will look like.
Assistant directing	The assistant director helps the director and sometimes works with a group of actors. S/he also makes sure that agreements are made between the different groups.
Script writing	The script-writers assist the director and write indications and changes to the script. Sometimes they write out the text for a scene.
Acting	The actors often have the main role in an opera and mainly act and sing. Often, they will also dance.
Music	The composer writes music or songs (which is called 'composing'). The musicians make the sounds and the music. The musicians can form the orchestra for the performance; if they are singing together, it is called a chorus.
Set designing	The set designer designs the set. The set builder builds the set.
Props	Props are all objects used in an opera. They are designed, made and collected by the responsible group.
Costumes	The costume designer designs the costumes and assembles or makes them.

Make-up	The make-up artist decides on the make-up of the actors and does the performers' make-up before the performance.
Dance	The choreographer designs the dancing and tells the dancers how to carry it out.
Technology	The technicians are responsible for making sure that everything involving technology runs smoothly: e.g. the (stage) lighting is working, the music starts in time.
PR (Public Relations)	The PR-group makes publicity for the performance and invites the press and the audience.
Organisation	The organisers make sure that everything runs smoothly.

Step 14 Everyone fulfils his or her own task for the performance

Normally, each group should now be able to start working independently. Motivate the groups to not debate for too long, but rather to start rehearsing, designing, investigating, organising and carrying out.

During the process, always check, check and double check again if the science is correct. Ask groups to do more research if needed. It is very easy to use science fiction, but this is not the aim of a SCIENCE opera. After the performance the audience should understand more about the scientific theme chosen.

Step 15 The opera performance

The children will perform the opera for their audience. We recommend doing a dress rehearsal before the performance. If you do this one day before the opera, the children will have time to improve what needs to be improved.

6. Write A Science Opera in 7 to 11 steps

with very young pupils, pupils who cannot read or write or have special needs, or pupils who do not yet speak the local language.

These steps for creating an opera are very similar to the steps in chapter 5. We decided to make a separate description with extra suggestions as the form slightly differs, especially because young children do not read and write yet. Also, children with special needs might not be able to write.

Please note that these steps are not intended to constitute a strict frame, but rather a guidance. Do give it your own personal twist.

Step 1 Pick a subject

Any scientific subject can work well with the WASO approach. Pupils can also pick a subject themselves.

Step 2 Introduce the subject

The introduction of the subject can be done in the same way as was described in chapter five. Write the subject in the middle of a large sheet of paper, paste a picture of the subject or make a drawing of the subject. Children can also do this themselves.

The next steps can be carried out by multiple groups, and similar to the process in chapter five, the sheets can be passed on to another group after each step. This is only possible if there are enough coaches available to guide all groups. These can be children from older grades, trainees, teaching assistants or parents.

If this is not possible, the next few steps can be carried out by the entire group or some smaller groups. One option is to use varying groups. While the other children are playing in corners, one small group can take turns working on the opera with their teacher. The first group takes care of step 3, the second group of step 4, etc. While doing so there is a rotation during which children are creating the story together.

Step 3: Choose the elements of the subject

Have children name elements of the subject they like, or find funny or special. Write or draw these around the subject.

Step 4: Pick one of the subthemes

Have children explain to each other why they like a specific element or find it interesting or funny. It is possible to guide the questioning: "Omar, could you explain what you find the funniest thing on that sheet of paper?" "Why?" "Anna, which elements would you like to more about?"

Voting is also an option. The subtheme is now elaborated and becomes the subject.

Step 5: Write down questions about this theme

Encourage the pupils to generate questions about the scientific subject-matter. Remember: there are no 'wrong' questions. Write down as many questions as you can think of. Targeted questions can help the pupils: "Who can ask a question to which we will certainly not know the answer?" "Who can come up with a question about ..."

Step 6: Choose one question and conceive a story about it

The children can take turns explaining their ideas. Another option is to have each of them come up with a part of the story. Make drawings while the children are speaking. Children can also do this themselves. Its 'meaning' does not need to be immediately obvious. You could also record this story telling, as a movie or sound recording. This could then be listened to in step 7. Another option is to elaborate and correct it with the children. The children could make matching drawings for each element and this 'book' could then be added to the reading corner of the classroom.

Step 7: Read the story for a second time, give it a title and come up with characters

If a sound recording or movie was made of the story, it is possible to have a look at it or listen to it with the group. Together the children will come up with a title. They also think of characters. Who does that? Who else was around?

Step 8: Add music, dances and/or songs to the story

Make the children think of songs with which they are familiar. Use the melody and change texts if needed. Maybe children can improvise songs about the theme. Others can play instruments.

Step 9: Turn the story of the opera into a storytelling pantomime

A storytelling pantomime is guided improvising. The teacher tells a story while the children play this story simultaneously. They all play the same role at the same time, individually and act without speaking, which is called pantomime.

Step 10: Tell the story one more time and make tableaux vivants

Tell the story one more time and have children make tableaux vivants of some elements of the story. Choose at which points the songs will be added or music will be used. The rehearsal is important to familiarize the children with the story. You could also ask the children to tell the story themselves.

Step 11: The performance

A simple way of realizing the performance could be to combine steps 8, 9 and 10. Children could take turns to be the narrator and short dialogues might be added.

7. Evaluation

Evaluation is a permanent element within WASO. The group will regularly meet, the sub groups will report what happened and share future plans. At the same time this is the perfect opportunity to ask questions and give feedback to each other. The subgroups also have their own evaluations, which aren't always planned. If you are stuck, these will automatically happen.

During evaluations it is important for children to know that they can freely give their opinion. As a teacher you play a meaningful role in this, the children need to feel secure enough to say anything. Even if children might react badly to the feedback of others, teachers must take care that this is handled well, stopped and explained why this is not the intention. Each child has the right to give his or her opinion.

We would strongly advise that the children give feedback at the end of the process. With younger children this can be done by talking about it.

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With Speel je Wijs (Play to wisdom/Play your own tune), Irma is internationally known for her work in promoting arts, STEAM, and mindfulness in education. She writes educational books, develops learning materials and gives lectures, and provides training courses to inspire professionals working with children.

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Image credit: Western Norway University of Applied Sciences

He has led several European initiatives in the field of creativity in education. Oded is a jazz musician and an Associate Professor of music.

More information:

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