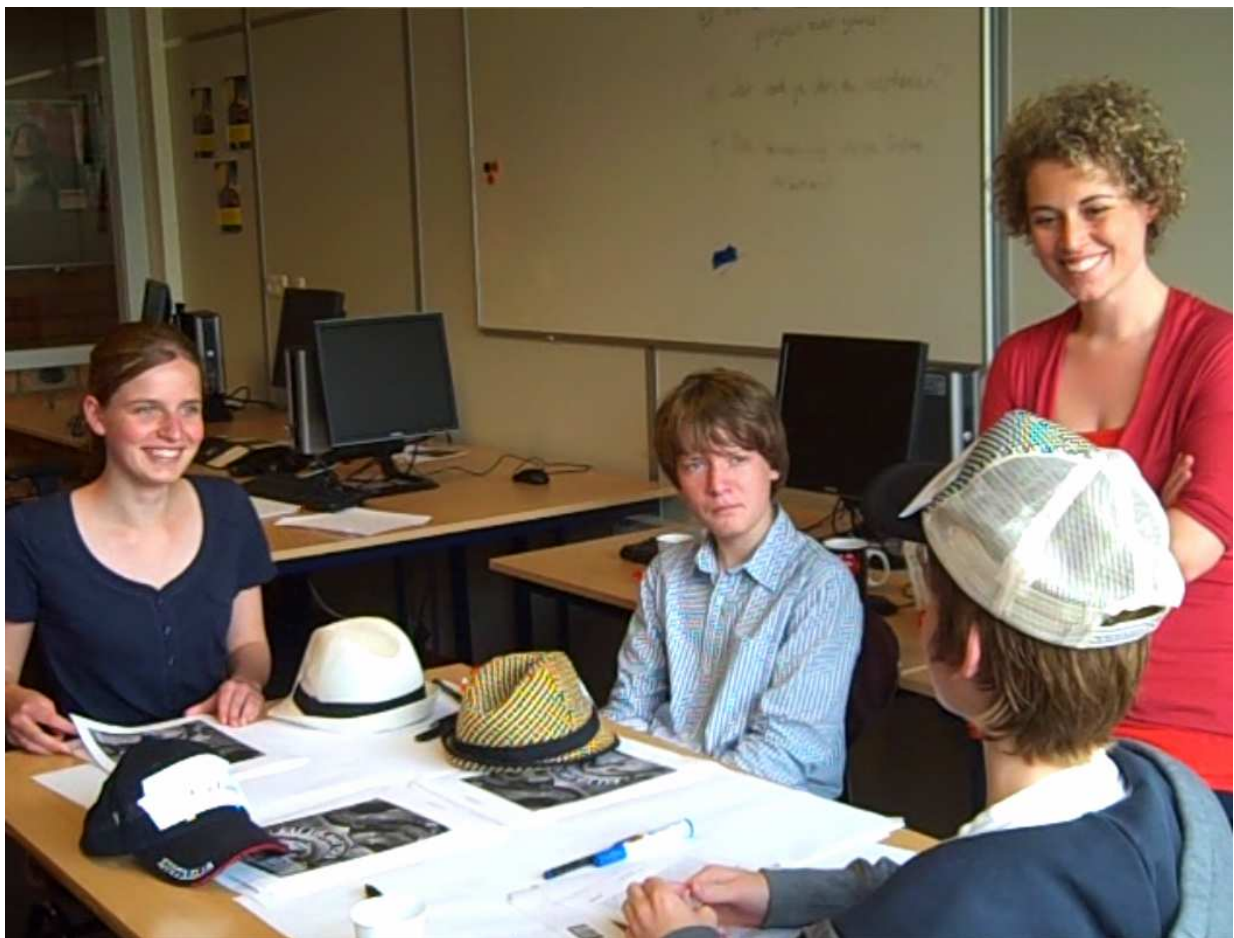


For Them, With Them

The practice of involving students in project co-design



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Abstract

New developments in education, such as Content and Language Integrated Learning and Co-operative Learning, create a need for new educational material. Increasingly, students' perspective on developing this material is being valued, but how to make their perspective explicit has not been described extensively. This study aims at describing the conditions to involve students in the co-design of a school project.

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Preface

This research would not have been possible without the help of certain people: Linda Albers, Roan van der Heiden, Aletta Meinsma, Simon van Vliet, Larike Bronkhorst, Ilonka van der Knaap, Marieke Folkers, Hennie Willemse, and Gerrit Jan Koopman. We would especially like to thank Linda, Roan, Aletta, and Simon for their enthusiasm, their great ideas, and for helping us eat all the candy. Also many thanks go out to Larike for guiding us in the right direction with her sparkling ideas and for cheering us up with every meeting. We also thank Ilonka, Marieke, and Hennie for providing us with the opportunity to do this research and for supporting our plans, and Gerrit Jan for keeping us on track.

Introduction

Education should aim at enhancing learning. Seemingly an obvious statement, yet only recently has the focus of educators stated to move from a teaching orientated perspective to a learning orientated perspective. (Barr & Tag, 1995) The surge of learning theories on the different ways in which pupils learn show the paradigm shift in educational research over the last decades. Coherent with this shift, new developments in education, such as Content and Language Integrated Learning and Co-operative Learning, create a need for new educational material.

Even though their perspective is valued, students are not often involved in the design process of their learning environment (Cook-Sather, 2001, 2006 in Könings, 2007). Not involving the students' perspective on a learning environment is a missed opportunity as it "directly influences learning and study behaviour and thus the quality of learning". (Entwistle & Tait, 1990 in Könings, 2007)

Participatory design of learning environments including the students' perception is a highly promising educational innovation that has been researched by Könings in 2007. This research demonstrates how students' participation in design can have a positive effect on a lesson based learning environment. According to Cook-Sather (2009) "Consulting students enhances student commitment and capacity for learning through strengthening self-esteem, enhancing attitudes toward school and learning, developing a stronger sense of membership, developing new skills for learning, and transforming teacher–student relationships from passive and oppositional to more active and collaborative."

By expanding research in this area into a project based learning environment, this article provides new insights on how students can be involved in co-design. As the methodology of student participatory design in project based learning environments has not been described extensively, this article goes into depth on how students can be successfully involved in project co-design.

The research question:

What are the conditions to involve students in the co-design?

The hypothesis of this research question is that students can be involved in project co-design by creating an environment in which they feel comfortable and appreciated. The use of a variety of cooperative learning work formats and stimulating the students to think from different perspectives will also play an important role in the process; see the Methodology section for an elaboration on this.

The Method section contains the case description, the rationale of the evaluation day which was setup to involve students in the project co-design, the participant selection, the used instruments, and a detailed analysis which explains the process of turning the raw data into relevant results. The five elements that were found to be of importance in involving students are elaborated upon in the Results section, and the Conclusions section translates these

results into an answer of the research question. The Discussion section points out the limitations of this research and proposes topics for further research.

Method

Case Description

The Anna van Rijn College is a bilingual school situated in Nieuwegein, the Netherlands. The first bilingual school in the Netherlands was founded in 1989, today over a hundred and ten Dutch schools offer bilingual programs. At all bilingual schools interdisciplinary and international projects are a significant part of the curriculum, also at the Anna van Rijn. These projects incorporate the learning of skills, language and content, often using CLIL methods. One of the projects developed for the bilingual stream is: *US, EU and YOU. The Research Project*. Working in groups, pairs, and by themselves third form students have their first practice making research questions, finding information, and presenting their findings as a group. Although most projects use cooperative assignments, this specific project contains an exceptionally high variety of work formats and leaves space for a lot of creative learner input; both aspects that are usually enjoyed by students. Hence, said project was expected to be perceived more positively than others.

The designers expected the project to be a success, yet without feedback from the students it is impossible to be sure. The question: *How do students perceive the Research Project?* rapidly led to a more complex question: *How to involve students in co-design?* To find the answer to both questions an evaluation day with a small focus group was planned. The focus group consisted of four students, to allow for a group dynamics that should provide the best working atmosphere. (Kagan, 1992) Below a description of the evaluation day is given, followed by an overview of the factors that influenced the students' participation over the day.

Rationale

The evaluation day was setup to obtain twofold information. Firstly, to discover the students' desires, satisfactions and dissatisfactions in relation to the actual project design; the content. In relation to the actual research question, another focus was set on the actual process which took place during the co-design activities. The setup of the evaluation day and application of the co-design activities were constructed with the following starting points in mind.

Social conditions

A lot of emphasis was put on making sure the students would feel comfortable throughout the day as this was likely to increase their engagement. According to Ryan & Deci (2000), "Human beings can be proactive and engaged or, alternatively, passive and alienated, largely as a function of the social conditions in which they develop and function." This is why an activity to get acquainted was incorporated at the start of the day, and a lot of verbal reinforcement and positive feedback was given throughout the day. "...when verbal reinforcement and positive feedback are used as the external rewards, the subjects' intrinsic motivation seems to increase..." (Deci, 1971). An informal setting was created to minimize the students to feel pressured, by providing food and drinks, and incorporating spontaneous breaks on a regular basis. "With respect to the interpersonal context...the most important issue is...the extent to which people within the context feel pressured to think, feel, or behave in particular ways." (Deci et al, 1999).

Cooperative learning

Various formats of cooperative learning were applied in order to stimulate the students to provide more input. According to Haenen and Tuithof (2008), "...it ensures that students are given the opportunity to think for themselves, share ideas, discuss evidence and debate points."

Different perspectives

Based on the idea of the six thinking hats of De Bono (1986), variations on the work formats were included in which the students were stimulated into creative thinking. According to De Bono (1995), applying a form of creative thinking has two levels of effect: a change in attitude towards creativity (students will be willing to look for further alternatives), and the use of the label of lateral thinking (students will be willing to point a finger at a particular focus). In this case, the students were stimulated to think from four different perspectives: the "Beterweter" (knows everything better, very keen on answering questions, very motivated), "Luilak" (not motivated, strives for maximum result by minimum effort, tries to dodge activities, lets group members do all the work), "Onzeker" (not sure what to do with instructions, asks a lot of questions on instructions, exactly wants to know what is expected) and "Buitenbeentje" (not social within the group, finds it hard to connect with others, prefers individual work).

A more detailed overview of the day programme can be found in the appendix.

Participant selection

This research is a qualitative investigation; therefore qualitative research methods are being used. To select our students we used the method of purposeful sampling (Greene & David, 1984). Below you will read how the participants were selected. Making the sampling process more public is something Onwuegbuzie & Leech plead for in their article (2007). The pupils for the interview were selected by the school, but beforehand the following criteria were asked for: some students from the 2nd and some from the 3rd grade, both boys and girls, who are not friends, and with some of them having a good level of English and others not. These criteria were chosen because they were all criteria that could influence the results. The students were expected to influence each other less if they were not friends. Different ages, different levels of English, and a mix of boys and girls were asked for because those factors were expected to influence their point of view on the project. However, on the day of the project it appeared that the pupils were not selected by the school according to those criteria. There were two boys and two girls, but all of them were from the third grade and good at English. They were also very similar in the sense that they all liked sciences (as opposed to arts). They were asked if they wanted to stay anonymous in the research or mentioned by their own name and all said that they liked to be mentioned by their own name or that it did not matter. Since they have been of such central importance in this research and as a way to thank them for their efforts it was decided to keep their names. The names of the four students that we did our research with are: Linda Albers, Roan van der Heiden, Aletta Meinsma, and Simon van Vliet. This makes $N = 4$.

Instruments

All activities during the day are filmed, to make it possible to look back at what happened and to rephrase what students said exactly. All three researchers led another activity during different times of the day and in the same time the two others made notes of what happened (find the observation scheme in the appendix). Two things were focussed on during these observations: the content (what kind of things are said) and the process (how does the day go, what works and what doesn't). Again something unexpected occurred, as during the day it became clear that it was impossible to follow the 'focus-schedule' exactly. Therefore instead of paying attention to only one aspect both researchers focussed on two aspects while making notes.

Analysis

Immediately after the evaluation day with the students first impressions were exchanged among the researchers. The abundance and variety of information demanded a specific focus in order to make a thorough analysis possible. Arguments arose to focus on the actual content related feedback the students gave on the design itself; other arguments opted for a focus on the process around the degree of engagement of the students throughout the day. After consulting a research expert, the decision was made to focus on both content and process related input.

Content related input

Using content related notes and a content focused analysis of the video footage, the researchers combined their findings and discussed which input from the students would be incorporated (and how) in the initial design. This resulted in a renewed design, including the students' contributions.

Process related input

Using the method of independent coding, each researcher analysed the process related notes and video footage, making report of all the situations which contained a clear case of (non)engagement with the students. This report included a description of the observation, definition of engagement or non engagement, and an interpretation of which factors caused this (non)engagement. The observation reports are included in the appendix.

A combination of the separate observation reports was made in an analysis scheme, which is included in the appendix. This scheme contains information on the observed situation, definition of engagement or non engagement, the interpretation of each of the researchers on the cause(s) of this (non)engagement, and the factors that influenced (non)engagement which were derived from the various interpretations. Comparing the interpretations differences among the researchers arose which were caused by different focuses: One researcher focussed on factors relating to body language and power structure, while another mentioned the factors relating to the attitude of the researchers, and yet another researcher pointed out the factors relating to work formats. During a discussion it was decided to include the interpretations and factors all researchers agreed on.

Five main elements

During this discussion, it also became clear that all the factors could be subdivided into five main categories which will be referred to as elements in this article: Instructions, Work format, Time management, Environment and Guidance. The factors were then allocated over these elements, after which each element was analysed. The extensive analysis of each of these elements is included in the Results section.

Results

Engaged or not engaged, that's the question

In the following part a brief example of engagement and non-engagement will be presented. This is done to give an idea of the difference between the two and to make the analysis more clear.

Not engaged

The following fragment (length 55 seconds) shows an example of non engagement. The students have finished the corners of opinion activity, and just sat down around the table.

37.14

Researcher [hands out the four hats to the students as she is speaking]:

"...ehm, the idea is, that you put up a random hat, and that you, eh well, you just had a look at the booklet, that you tell us from your role, eh what your thoughts would be about the project."...

Researcher [moving her attention towards Roan, holds the hat up in front of him].: "So ehm, you are the 'Luilak', what does he think, that you just say, what do you think after, eh, seeing and reading through the booklet...maybe you can put up the hat if you want" [the researcher puts up the hat with Roan as she says this]

[Roan fiddles around with the hat]

Observing researcher: "...For inspiration"

Researcher: "...[giggling]...yeah"

[all (Simon, Roan, Linda, Aletta, researcher and observing researcher) look at Roan to respond, Aletta smiles]

Roan (quietly): "ehm, actually I would not know what he would think..."

Aletta [intervenes]: "What would you think yourself?"

Simon (ironic expression): "Just speak from experience"

[Aletta giggles, researcher smiles]

Roan (quietly, mumbling): "No Simon, I can't do that. I am just not really good at transferring myself..." [Roan fiddles around with a piece of candy wrapping plastic]

Researcher [intervenes, speaks fast]: "Okay, just put it down for a now then you maybe can, ehm, if you perhaps want to have some thinking time, maybe it is good that you have 2 minutes of thinking time, to think about what that role would think, so, ehm, what would that person think, if he just browsed through the project, just had the introduction from the teacher..."

[students look down; seem to think about their response]
38.09

This fragment clearly shows how the quick and out-of-the-blue instructions have a negative effect on the engagement of the students, Roan in particular. To make this interpretation both Roan's verbal and body language are observed. The fact that he mumbles, fiddles with the hat, speaks quietly and that he looks down are all signals that are interpreted as him not being engaged. On top of that he literally says things like: "I would not know" and "I can't do that". The fragment also shows that Roan does not feel comfortable with the sudden attention from everybody towards him; the guidance in this fragment is therefore ineffective as well.

Engaged

The following fragment shows an example of engagement. The students are in the middle of the work format corners with opinions.

33:24

Researcher: "The statement is: I have the idea that the project is useful. If you think 'yes it is useful' you go to this corner [directs with hands at right corner], if you think 'no not at all' then you stand there [directs at opposite corner] and do you think 'I doubt' you stand there [directs at left corner]."

[Students move to corners. Aletta and Linda go to right corner, Roan to the left corner and Simon takes the opposite corner]

Researcher: Let's start with you [to Aletta and Linda], you think it is useful.

Aletta and Linda: "Yes..."

Aletta: "Especially because of the introduction there..."

Linda: "There a lot becomes clear."

Aletta: "Yes. You immediately think 'You need it for later, research questions are important'. So then, with such a start you will think 'O I am going to make this because it is important for later'."

Linda: "It is useful."

Aletta: "Yes."

Researcher: "Yes."

Aletta: "It is not, for example, about rabbits that you will never do anything with later. [smiles] You understand?"

Researcher: "Yes, yes, ok, so in that sense it is possible to combine the introduction..."

[Roan walks to the corner of Aletta and Linda]

Researcher: "Hmm yes ok."

Roan: "I was doubting a lot, but they convinced me. Because the instruction..."

[Aletta and Linda smile and give each other a high five]

Roan [smiles a little]: "... made clear what they said it did."

Researcher: Ok, good.

Simon: "I think the introduction makes clear that it is important. But if it is just boring, if you think that 'Well research questions that is just boring I am not going to do that', then you will not think 'O I will do it because it is useful for later'. If you already think that it is a boring topic then I don't think you will be convinced by the argument that it is useful for later and suddenly think 'Then I will work very hard for it'."

34:48

In the example above you can read how the working format has an influence on the engagement of the students. There are several signals that led to the conclusion that the students are engaged at this moment. For example the fact that they smile a lot, that they give each other a high five, and that they react on each other without interference from the teacher. They are able to express themselves easily and defend their own answers convincingly. Those verbal and body language signs led to the interpretation that at this moment the students were fully participating. The example makes clear how a good working format has a positive effect on the students and makes them participate enthusiastically, while in the same time a working format that the students don't feel comfortable with 'turns them off'. The examples show that using the right working formats is an important condition to involve the students.

To answer the main research question: 'What are the conditions to involve students in co-design?' five elements are found to be relevant factors in the engagement level of the students: Guidance, Working formats, Learning Environment, Instructions and Time management. These elements were found by grouping the 52 different statements that came out of the video analysis (see the conclusion pillar in the analysis schedule). A lot of those fifty-two conclusions that were found overlapped and were therefore grouped. The

way to group them was by discussing what were overlapping factors in the conclusions, how they could be categorised and how the different categories could be named. First it was not sure if instructions and guidance had to be considered separate categories as they seem somehow similar. But then it was decided that they could be distinguished and had different effects. Therefore they are made into two different categories.

In the next section you will read how the five categories, which shall be referred to as elements in this article, influenced the engagement level of the students. The sections 'Guidance, Working Formats, Environment, Instructions and Time Management' each describe the observed behaviour of the students and the interpreted reason of that behaviour. So the section 'Guidance' will show how actions from the side of the researchers, related to Guidance, influenced the engagement level of the students, based on the common interpretations of the researchers.

Here you see the five elements that influenced the engagement of the students in a table and visualised in a chart:

Elements	Total	%
Guidance	18	35%
Working Formats	15	29%
Environment	8	15%
Instructions	6	11%
Time Management	5	10%

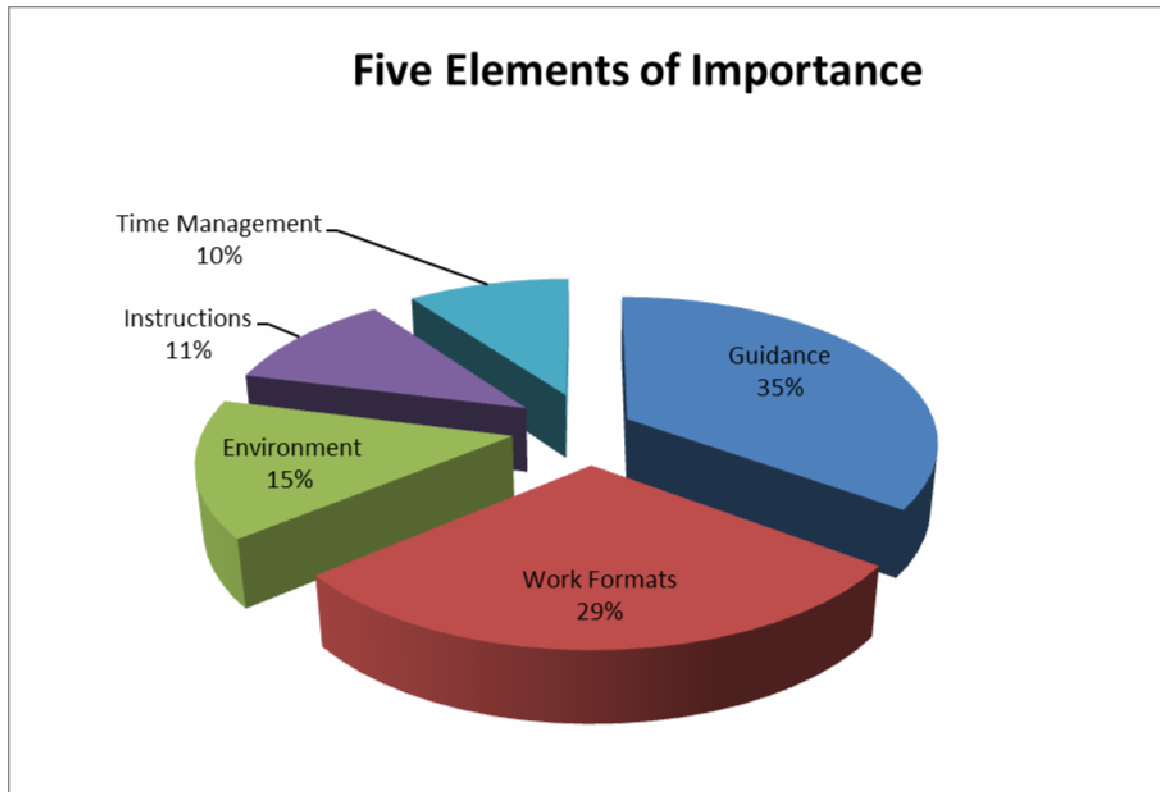


Figure 1

Elements

Guidance

Guiding the students well has been of main importance for their degree of engagement throughout the day. The analysis showed that 18 out of 52 factors were influenced by Guidance, which is more than by any other element. Guidance is different from Instruction in the sense that Guidance is any situation in which the researcher provides direction without a learning element. Guidance is the steering of social processes and the communication with students, without the element of giving good explanations.

During the research constant emphasis was placed on making the students feel at ease. This was done for example by joining informal conversations, by providing sweets, responding positively to their answers, by rephrasing and asking for clarification. When the break was announced the students obviously showed relief in their behaviour. They became more active, chuckled, chatted informally, and made jokes. Their body language showed that they felt comfortable and they were not afraid to ask for clarification.

At the start of the day, Simon and Aletta were more talkative than Roan and Linda who stayed in the background. When one of the researchers asked: "Linda, do you agree with what they say?", both Linda and Roan contributed to the discussions from then on. An example that shows the effect of not steering this kind of group process is when one of the researchers asked the group a specific question to think about. The result of this action was that Simon started to answer the question, and moved his focus towards the researcher instead of discussing it within the group. Straight away, both Linda and Roan (the least dominant pupils) lost interest in the discussion. During the corner game however the researchers let the pupils discuss amongst themselves without interference, which made the discussion very active. The researchers let some initiative with the pupils which turned out to have a positive influence on their level of engagement. For instance they were asked if they needed more time or not and they could decide the time slot themselves. On moments that they were not watched closely they also showed signs of engagement.

When one of the researchers asked the students: "*So that means we don't have to change something. Or should we change something to make it better?*" The reaction of the students was to say 'no' and to look down. This reaction was interpreted by the fact that asked question was closed and did not stimulate them to think and answer elaborately.

At the beginning of the day one of the researchers told the students that their answers were very important and that their opinion would really influence the project. The students said at the end of the day that they had really liked that because "*normally they just had to do projects because adults told them to and now they actually had some space to say something about the project*".

Work Formats

A good second after Guidance, the choice of Work Formats plays a mayor factor in the success of the evaluation day. The factors related to Work Formats that influenced the evaluation day at the Anna van Rijn are: the use of activating work formats in which the

students have a lot of freedom to give their opinion, providing work formats that provoke discussion, and the use of activities the students can relate to.

Activating work formats that provoke discussion

Activating work formats in which the students had a lot of freedom to give their opinion increased the input and the feedback received on the project. Mid morning the students were asked to give their opinion on the project's booklet using the 'corners and statements' work format. The researcher in charge read out statements, the students thought them over, and based on their opinion (agree, disagree, somewhere in between) they chose a corner and walked over there. This activity is activating both intellectually as students have to think for themselves and physically as the students have to literally move towards a corner. As a result, the students actively participated and discussed the statements amongst themselves.

A less activating work format used was 'Think, pair, share', an activity in which the students were seated and were presented with a question, which they had to consider individually, discuss with their neighbour, and finally with the entire group. This activity took place twice, discussing different aspects of cooperative assignments in the project. During the second activity, at the point the students were supposed to 'share' with the entire group, they provided very little input and after a fairly short time they were finished with the discussion. Despite the freedom the students had to share their opinion with others, the rather passive activity does not encourage them to participate.

The use of diverse work formats had a positive influence on the students' participation. During the evaluation of the entire day, all four students stated the diversity of the work formats had played a role in keeping the day interesting for them.

Different roles

To give the students a tool to look at the project from different viewpoints it was decided to introduce different roles at the start of the day. The roles were based on four very diverse types of students: a loner, a sloth, an overachiever, and an insecure student. At the end of each work format the students would be handed one of the roles and would respond as if they were in that specific role. Expectations were this activity would enrich the data and make the students less self-conscious about personal statements, as they would not be speaking for themselves, but for their role. During two work formats the students used the roles in very different ways: once actively engaged, once not engaged at all. When the researcher took charge and gave each student a role, there was little response from the students.

Later in the day the students were asked to 'think, pair, share' about the composition of groups in the project. During the group discussion Aletta, without any incentive of the researcher, responded from one of the roles: "Well, but say if you are the loner, for example, and you have to make your own groups, you are pretty sure no one will want to be in your group." Without being forced in a role, Aletta voluntarily chose to use the perspective from one of the roles.

Environment

The analysis shows various situations (8 out of 52) in which the Environment influenced the degree of engagement of the students. Environmental factors include both the physical environment, such as the location of the evaluation, and side issues, such as offering food and drinks.

Location and external disturbance

At one point during an activity in which the students showed comfortable behaviour and clear engagement one of the team leaders disturbed the setting by announcing the room had to be cleared as it was needed for other purposes. It was observed that the students got a bit anxious: They sat up straighter, their conversation came to a standstill, and Aletta gave an ironic smile indicating she did not want to change location. Eventually there happened to be a misunderstanding, and no change of location was needed. Once the team leader left the room, the students got back to what they were doing and acted the same as before the intervention.

This observation includes two factors which had a negative effect on the engagement of the students. The external disturbance had a negative effect for only a short period, from the moment the team leader entered the room until shortly after he left. The uncertainty concerning the location also showed a negative effect for a short period.

Physical setup of location

During the corners of opinion activity, the students showed signs of feeling uncomfortable. Peers, researchers, and cameras were always very close by which made it hard for the students to find a comfortable posture. Simon had a hand in his pocket, leaned against the table, and moved his legs in a nervous way. Aletta stood with her legs in front of each other. Roan and Linda held their arms crossed in front of their bodies. Linda's shoulders were hanging a bit forward.

During the think-pair-share activity, it was observed that the pair Linda and Roan spoke softer than the pair Aletta and Simon. Roan and Linda stopped discussing very soon and started following the other pair instead. During the general evaluation of the day, the students mentioned that they found it hard to focus on their own discussion, because of acoustics and their proximity to the other pair.

During another part of the think-pair-share activity it was observed that because the students were seated so close together their information got cross-pollinated. This caused the pairs to automatically change their pair-activity into the share-activity, which resulted in a valuable discussion.

In the first two cases, the physical setup of the location had a negative effect on the engagement of the students. The room was too small for the students to move and position themselves in a comfortable way during the corners of opinion activity. The observation of the think-pair-share activity also indicates the physical setup of the room had a negative effect on the engagement of the students. The cross-pollination of information which is mentioned in the third case was caused by the physical setup of the room as well, but in this case it turned out to have a positive effect on engagement.

Food and drinks

The students mentioned during the general evaluation of the day that they were very motivated to cooperate throughout the day because they felt important and appreciated. According to them, this was partly because of the extensive variety of food and drinks which was offered to them. They also mentioned how they particularly liked the arranged lunch with other teachers in the school.

Even though no clear observations have been made which indicated a direct increase in engagement under this header, the feedback from the students does indicate that the presence of food and drinks had a positive effect on their engagement throughout the day.

Instructions

Giving the right instructions before starting a working format has been of importance for the degree of engagement of the students. The analysis showed that there had been 6 out of 52 factors in which Instructions had an influence on the students. Instruction is different from Guidance in the sense that it has a learning element in it. Instruction is about giving good explanations so the students know what to do and what is expected from them, it is not the steering of social processes.

During the beginning of the day the researchers started very relaxed. What the day would look like and what was expected from the students was explained clearly and slowly. Every new step that was taken was explained again. The researcher always asked the students at the end of an explanation if everything was clear. For their instruction they used the whiteboard and sometimes pen and paper. With those tools the researchers could visualise for the students what they were going to do. It also focussed their attention and helped them to remember the order of tasks and the questions they had to ask their partner during the interview assignment. During those moments of instructions the students felt free to ask questions and had a comfortable body language.

The role play game, in contrast to the former instructions, was explained very quickly. Because the roles were worked with before, the researcher in charge thought that everything was clear for the students and that they knew what was expected from them. She put a hat on the head of Roan (see elaborate example on page 8) and asked him if he could answer a question in the role that was written on the hat. His body language at that moment shows that he is uncomfortable with the situation and the only answers he gives are: *'I don't know'* and *'I don't think this person would think so much of it'*. He talks quietly and looks down. The student in question was definitely not engaged and his behaviour was interpreted as a negative effect of not giving enough and good instructions.

Time management

Being focused an entire day is very tiring and planning an evaluation day the time of day should be considered as a major factor. On a macro level: We found the students to be more alert at the start of the day and tired at the end of the morning and afternoon, also right after the lunch break the students appeared tired. On a micro level time management turned out to be a significant factor in success as well: Giving students time during activities to formulate their opinion had a positive effect on their engagement.

Macro time management

During the first 'think, pair, share' exercise most of the time the students were engaged: they sat up straight, they responded to each others' statements, and they discussed amongst themselves. The final group discussion lasted for five minutes without teacher interference. During the second 'share' activity their participation was less active, as they provided very little input and after a fairly short time they were finished with the discussion. During the first part of the activity the students were engaged; during the second part they were not engaged.

At the end of the day, the students were asked to interview each other with pre-set questions about the output in the project. They do as they are told, but are not engaged: they do make eye contact often, they lean back in their seats, and the answers they give are short and unelaborated. At the end, the researcher asked an open question to ignite a group discussion. This discussion lasted one minute and twenty seconds, a quarter of the time the earlier discussion lasted. The length of the discussion, the body language of the students, and the manner in which they respond to each other demonstrates the students were more engaged earlier on in the day.

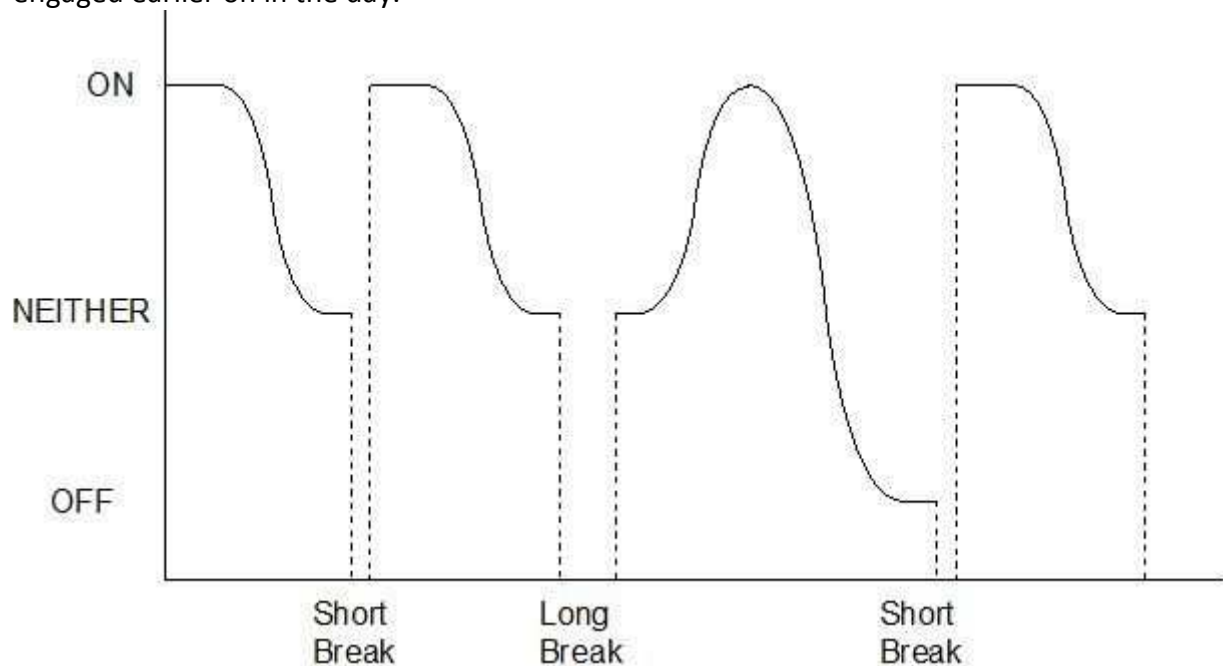


Figure 2: Student participation over the day

Micro time management

On a micro level the feedback of the students was highly influenced by Time Management as well. A ten minute break during an activity had a considerable influence on whether or not the students were engaged, as described below. The 'think, pair, share' activity was done twice. During the first round the students were definitely engaged, especially compared to the second round, in which they obviously lost interest: they gave short answer and the group discussion did not last very long. The teacher realised the students were tired and gave them a ten minute break. After the break, students showed renewed interest in the activity: They had an active posture, smiled, nodded whilst receiving instructions and started the 'think' activity full concentration. They also took initiative in switching from the 'think' activity into the 'pair' activity, and later into the 'share' activity.

Conclusions

The answer on the research question: 'What are the conditions to involve students in co-design?' can be answered with the five elements that are found to be relevant for the engagement level of the students: Guidance, Working Formats, Environment, Instructions, and Time Management. The analysis of these elements has led to the following conclusions:

With regards to Guidance, the results of the analysis indicate that it is important to make the students feel at ease in several ways, because this keeps them engaged. Ways that were successful were giving them positive feedback, joining informal conversations, and providing them with food or drinks. It also turned out that it occasionally had a positive effect not to interfere in group discussion while other times it had a positive effect to steer the social processes, e.g. making sure all students participate. We noticed that some students had a tendency to stay more in the background (a social process that occurs in almost any group) and it helped to engage those students by giving them space to join the conversation. It worked equally well to ask open questions, to rephrase what the students said, and to ask them for clarification if their answers were not clear.

The right Work Formats at the right time of the day has turned out to be a crucial element in the engagement level of the students. It has been shown that active Work Formats invite participation from the students and help to keep them engaged. It also became clear that, not only on the level of Guidance, but also on the level of Working Formats, little teacher interference can enhance students' participation. This means that it can have a positive effect on the engagement level of the students if the researchers are not on top of their answers, but instead give them some activities on which they can work individually or in smaller groups and ask for their answers later. Using diverse working formats also motivates the students because it keeps the day diverse and challenging for them. When it comes to using roles the research designates that the use of roles can have a positive effect and increase gathered information, but only when used eloquently. Forcing the students in role that they don't feel comfortable with has a negative effect on the feedback of the pupils and should be avoided.

With regards to Environment, the results indicate a fixed and secured location is important, so there is no uncertainty whether you can stay in your location or not throughout the day. A change of location could have consequences for the comfort level of students and their engagement. Based on the observations with regards to the external disturbance, it is important to bring these disturbances to a minimum as they can have a negative effect on the engagement of students. The physical setup proves to be an important but also ambiguous factor. In the first place, it is important to make use of a location which is spacious enough for the activities used in the co-design. Neglecting this may cause the students to feel uncomfortable in their position, or it can cause the students to be distracted easily by each other and therefore not being able to focus on the task. On the other hand, a situation was observed in which the limited space in the room actually enhanced the engagement of the students. Based on these findings it can be concluded that it is important to have a location which suits the activities used in the co-design. Offering food and drinks

throughout the day contributes to the feeling of being important and was appreciated by the students. This increases their motivation and therefore increases their engagement.

Giving Instructions in the right manner is crucial to make the participatory design study a success. Students like to know what is expected from them and in this research it has been very clear that when the researchers did not take their time to explain calmly and clearly what was going to happen had a negative effect on the engagement level of the students. The research also suggests that it can help to give the students an example to break the ice if they find it difficult to start because they don't know what is expected from them. The research further suggests that using tools, like a whiteboard, to visualise the instructions keeps the students focussed and helps them remember the instructions.

During the day the students clearly had low and high energy moments and it turned out that it is important to take these moments into account when deciding about the order of work formats. It works well use the most activating work formats on moments when there energy level would be low, because it helps to keep or get them engaged. The research has shown that the low energy moments are at the end of long activities and at the end of the morning and afternoon. To keep the students engaged it can help to plan short and regular breaks during the activities. Also from their body language it often becomes clear when they need a break and of course letting them decide when an activity has lasted long enough is also an option.

This article has gone in depth into showing how students can be involved in co-design. By doing so under the right conditions this research demonstrates how student's participation in design can have a positive effect on learning environments and that it can contribute to practical outcomes of the research. The five elements found can be used as a new insight on how to involve students in co-design. A bullet point conclusion can be found in the appendix (page 43).

Discussion

Design researchers operate in different epistemological cultures and face the challenge to apply the different goals, instruments, and academic rules used in these cultures in one research (Akkerman a.o. 2011). The design research described in this article clearly shows a combination of teaching culture and research culture, as teacher vocabulary is used to describe research outcomes. Teacher vocabulary is used throughout the article, most clearly in the elements described to influence the evaluation day: Guidance “a situation in which the teacher/researcher provides direction”, student centred Work Formats that involve “motivation, play, creativity, self-concept, discovery learning, constructivism, integration, moral and values education, pupils learn differently, learning and thinking skills, problem solving and self-management”, Environment which consists of “spaces for learning [that] should invite and support the activities ... and that should respect the inhabitants of the space”, Instruction “a situation in which students learn through interactions with teachers/researchers and/or peers”, and Time which is “of the essence when planning [a lesson]” (Woolfolk a.o. 2008).

A way to neutralise the complexity of combining different epistemological cultures when working on design research is by making the decisions on which the research is based transparent (Akkerman a.o. 2011). Doing so demonstrates which decisions were taken by the researchers/designers when using vocabulary, concepts, or research methods from distinct paradigms during their investigation. The use of teacher vocabulary in the description of the research outcomes in this article demonstrates how design research can form a bridge between the distinct cultures of designers and researchers, which are often worlds apart.

The results presented in this article are based on one evaluation day with four learners and readers should take this into account when using these results for further research. Considering this limitation, new research that builds upon the findings presented here will definitely be useful as it will provide researchers and teachers with more knowledge on how to successfully incorporate users in co-design. Several qualitative researches on different schools and with different users will provide educational researchers with a more complete picture, making further qualitative research advisable. Especially when design researchers take the complexity of combining different paradigms into account by being transparent in their choices, further qualitative research on how to incorporate users in co-design may open a new world of design research in which academic and education cultures are merged (Akkerman a.o. 2011).

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Appendix

Day programme evaluation day

0900	Introduction and getting acquainted
0930	evaluation of <i>project introduction</i> - Introduction of the project - Placemat activity - Who am I activity (including roles)
10.30	evaluation of <i>input</i> (layout and content booklet, use of English, etc.) - Corners of opinion with statements activity - Role-play activity (including roles)
11.30	evaluation of <i>collaboration and feedback</i> - Think-Pair-Share activity
12.30	Lunch break
13.00	evaluation of <i>output</i> (final presentation with group) - Interview activity
14.00	evaluation of the day - Plenary discussion after thinking individually first
14.30	End of evaluation day

(From 09.30 onwards, one hour is scheduled for each category, 4 hours in total. This time is flexible in order to allow opportunities to go into more depth on certain information, or move on quicker. Short breaks will be included, which can be decided on at will.)

Analysis schemes

Analysis Scheme Part Researcher 1

What happens?	Engaged/ non engaged?	Interpretation researcher 1, 2 and 3 (R1, R2, R3)	factors
<p>The pupils pay attention to the explanation. Aletta nods frequently, sits up straight, cleans up her notes ready to start. Roan nods as well, and feeds off the information Aletta instigates.</p>	<p>engaged</p>	<p>R2: clear and calm explanation by R1, original working format which is new to the pupils. R3: clear what will be done and what is expected of pupils R1: early morning, high level of concentration. Due to the clear power structure, they are polite and quiet</p>	<p>Bring across clear instructions in a calm way, making sure the pupils know what is expected of them.</p> <p>Make use of original working formats which instigate interest with the pupils.</p> <p>Work through your most important activities during the start of the day.</p>
<p>Right from the start, pupils move towards their corner of opinion, start sharing their opinion straight away. Simon and Aletta take the most initiative, but Roan and Linda also contribute; everybody feels comfortable to participate.</p>	<p>engaged</p>	<p>R1: work format motivates pupils to speak R3: different corners really show different opinions and make discussion easier</p>	<p>Make use of work formats which stimulate pupil's input</p>
<p>At the start, Simon and Aletta say a bit more and Roan and Linda are more on the background. R1 asks "Linda, do you agree with what they say?", and both Linda and Roan contribute to the discussions from then on.</p>	<p>engaged</p>	<p>R2: steering the conversation by R1 helped here, just to start the quieter pupils up.</p>	<p>Steer conversation to start up quieter pupils.</p>
<p>Throughout the working format, pupils have clear opinions, take initiative in making contributions, discuss, use their hands while talking, replenish each others phrases, chuckle every now and then.</p>	<p>engaged</p>	<p>R2: R1 allowed the pupils to think for themselves first before discussing, sums up the different opinions before asking them to share these. She also gives them a sense of equality between teachers and pupils, and make them feel important. R1: The work format really makes the opinions of the pupils clear, it motivates them to speak because they want to</p>	<p>Make sure the pupils feel listened to; that they feel important.</p> <p>Make use of an effective work format which provokes discussion, and which allows the pupils to be active.</p> <p>Let pupils discuss amongst themselves without interference.</p>

		defend or explain their opinion to the person who is standing opposite to them. R3: Letting the pupils discuss amongst themselves without interference. The pupils can move around, it is very active.	
Pupils find it hard to compose a comfortable posture. Simon has a hand in his pocket, hangs against the table, moves his legs in a nervous way. Aletta stands with her legs in front of each other. Roan and Linda have their arms crossed in front of their bodies. Linda's shoulders are hanging a bit forward.	Non engaged	R1: physical setup of the room is fairly small for this working format. Peers, teachers and cameras are always very close by.	Make sure you have a spacious working space
R1 asks Roan to think from his perspective ("luilak"), and at the same time puts up his hat. The other pupils laugh at this moment. Leon reacts a bit hesitant. He starts to speak, but does this fairly quietly.	Non engaged	R2: the request for information should not catch a pupil by surprise, and the pupil should not suddenly be positioned in the centre of attention. R1: Pupils did not feel safe in this format, teachers should have given an example first to show it was fun. R3: explanation is short, pupils are overwhelmed by the exercise.	Do not set up pupils in an uncomfortable position. In potentially sensitive activities, give an example first to break the ice. Take your time to explain activities, making sure pupils know what is expected of them.
R1 takes the activity back to the whole group. Simon explains the opinion from his perspective, but his information seems a bit forced and unrealistic. Contribution of Aletta and Linda is very hesitant, with regular "uhhmmm" moments, and sentences ending with a question mark and uncertain facial expressions. Linda speaks very quietly, makes her body small and doesn't speak from the character but about the character ("I think he...") Aletta	Non engaged	R2: pupils do not like to be forced into thinking from a different perspective. R1: Pupils had already said everything they wanted to during the previous round, so it feels if it doesn't add so much. R3: After the corner game, this exercise is very passive.	Do not force pupils to think from a different perspective. Keep the activity relevant and interesting to the pupils.

starts with “eh yes eh” and “yes eh maybe yes I don’t know” showing she is not very confident or doesn’t know what to do.			
At one point, pupils start arguing from the perspectives of others. In this way they decide on their own perspective, rather than sticking to the perspective given to them.	engaged	R2: Engagement of pupils is stronger when they can choose on their own perspective.	Let pupils choose their own perspective.

Analysis Scheme Part Researcher 2

What happens?	Engaged/ non engaged?	Interpretation researcher 1, 2 and 3 (R1, R2, R3)	factors
The pupils pay attention to the explanation. They are at ease, eat sweets and ask for clarification.	engaged	R2: The relaxed approach of R2 and the clear instructions R3: - small steps, each step is explained carefully - time for questions, each question the pupils have is answered elaborately R1: - sweets - the text on the board - the way R2 sits with them and uses his voice/body	Take the time to explain the exercise and make them feel comfortable. Explain clearly what they will do, using the whiteboard. Be friendly and open towards the pupils.
they speak a bit softer (Linda and Roan)/or louder (Simon).	Non engaged (ish)	R1: sitting too close together	Make sure the pupils have enough space to sit, especially when doing a pair activity.
Think, pair, share. They take their time and decide for themselves when to swap.	engaged	R2: teachers are not really present in the process anymore and do not interrupt in their communication giving the pupils the idea that they are not being watched stimulates their engagement R3: - pupils are given time and space to discuss amongst themselves, we are not interfering and do something else - discussing in pairs really	Give the pupils space and time to start a group discussion. Teachers should interfere as little as possible when pupils are discussing. Do not try to steer the conversation.

		<p>works: everyone is listened to</p> <ul style="list-style-type: none"> - very relaxed atmosphere - we ask the pupils if they need more time or not: the pupils decide the time slot - we do not steer the direction of the conversation <p>R1: We are not so on top of them when they are discussing amongst themselves. That also seems to work. Some freedom. Maybe also time of the day.</p>	
<p>R2 asks the pupils to swap from sharing their thoughts in pairs, into sharing thoughts in the group. After this, a short moment of silence occurs, then Simon takes initiative saying: "Do I have to start again?". This indicates that the others were hesitant to start up the discussion, and everybody was waiting for someone else to start. Simon, being the most dominant force in the panel, starts the discussion. Shortly after, the others join in and the group discussion runs well.</p> <p>I also notice that Roan almost doesn't speak during this task. He is with it, but the others are just quicker or louder.</p>	<p>engaged, but could have been non engaged</p>	<p>R2: One should be careful in leaving the initiative to speak with the pupils, as dominant pupils could overshadow the less assertive pupils</p> <p>R1: really important that the teacher guides and sometimes gives a turn to those students that are not so present in the group.</p>	<p>Involve the students that are not participating actively (difficult to combine with last tip).</p>
<p>Aletta smiles and the students sit up straight. They are maybe a little anxious but it does not disturb the situation because they are not working.</p>	<p>Engaged, could be non engaged</p>	<p>R1: Henny walks in.</p>	<p>Make sure you have a spacious working space where you will not be disturbed</p>
<p>Even though the pupils are expected to react from their personal perspectives, Aletta spontaneously comes up with a perspective from one of the roles ("..but imagine you are the 'buitenbeentje', then...").</p>	<p>Engaged</p>	<p>R2: It is better to include the reasoning from a different perspective in a more natural way throughout the work formats</p> <p>R1: roles work depending on how and when you use them</p>	<p>Introduce the roles in the beginning and suggest if they can imagine what a person in such a role would feel.</p> <p>Keep it relaxed and leave the initiative with the pupils.</p>

R2 asks the group a specific question to think about. The result of this action is that Simon starts to answer the question, and moves his focus towards R2 instead of discussing it within the group. Straight away, both Linda and Roan (the least dominant pupils) do not show much interest in the discussion anymore.	Non engaged	R2: A teacher should make sure that the discussions stay within the panel	Do not interfere with group discussion.
Pair changes automatically in share	Engaged	R1: because they sit so close to each other that they hear each other all the time <i>(positive side from negative aspect)</i>	Small space can be an advantage when switching from pair to group work.
During the 'share' activity, it is clear that the pupils lose interest. After a short time, Linda chuckles and drops down her head, indicating she is tired and is struggling to concentrate. Simon starts to talk about something which has nothing to do with the assignment, and the other pupils join the conversation shortly, even though they are still supposed to discuss in pairs. Then R2 asks the pupils to share their opinion, but after a fairly short time they are finished with the discussion. Not much initiative is undertaken anymore, and Aletta gives R2 a look which says "we are done!".	Non engaged	R2: This decrease in span of concentration can be explained by the fact that at that moment, the big break was about to start and the pupils had been working for about three hours. A fairly passive activity, such as this one, should not be performed at the end of a fairly long period of intensive activities	Make a careful time planning in which activities later on are more active than those in the beginning.
Once the break is announced, the pupils show relief in their behaviour. They become more active, chuckle, chat informally, and make jokes. R2 also joins the informal conversation, making the 'distance' between pupils and teachers even	engaged	R2: By joining informal moments, the teacher can decrease the gap between teacher and pupils, which can make them feel more comfortable throughout the day. R3: - teachers are definitely at	Make the pupils feel at ease by joining informal conversation, providing sweets, responding positively to their answers, rephrase and ask for clarification so the

smaller.		ease; eating, drinking, laughing. the atmosphere is very relaxed - we respond positively to their answers - we ask for clarification and rephrase their answers	pupils feel listened to.
After the break, pupils show renewed interest in the activity. They have an active posture, smile, nodd while receiving instructions and start the 'think' activity full concentration. They also take their own initiative in taking the 'think' activity into the 'pair' activity, and later into the 'share' activity	engaged	R2: It is very important to include regular breaks throughout the day. R1: R3 quickly provides them with soda to crick up the sugar level again ;-) She uses the names and that works well.	Plan regular breaks and feed them sugar. 😊
R2 says, so that means we don't have to change something. Or should we change something to make it better? They say 'no' and look down.	Non engaged	R3: - open questions work well R1: – always ask open questions	Ask open questions so the pupils are stimulated to think and answer elaborately

Analysis Scheme Part Researcher 3

What happens?	Engaged/ non engaged?	Interpretation researcher 1, 2 and 3 (R1, R2, R3)	factors
<ul style="list-style-type: none"> - Interruption by teacher - Uncertainty if we can stay in the room <p>At one point during this activity, Hennie (teamleader) enters the room and announces that we have to leave the room. Aletta smiles and the students sit up straight. Luckily, his information is not correct and we can stay in the room to finish our evaluation. This intervention does not show any effect on the</p>	Engaged (but could be negatively engaged)	R2: does not show any effect on the engagement of the pupils R3: They are maybe a little anxious or surprised but it does not disturb the situation.	-Make sure to have your location fixed. -Make sure you are not disturbed during the activities.

<p>engagement of the pupils, because they are not working, but this could have been different if we did move out of the room.</p>			
<ul style="list-style-type: none"> - Students don't speak so much - Students make no clear statements - Students give short answers - Students have soft voices - Less quality in answers students - Students have tired facial expressions <p>Everyone seems a bit tired after the lunch, the energy level isn't very high. The pupils are not very active in participating anymore.</p>	<p>Non engaged</p>	<p>R2: At the end of this activity, discussions are initiated from a more plenary context, where pupils are not stimulated to participate through the active activity anymore.</p> <p>R3: -after lunch they are tired -the format does not give room for an open discussion (interviews in pairs) -no clear statements, so no discussions</p> <p>R1: I don't think it is because of the work format, I think it is because of the time of the day. It would have worked better to use something active now or another format in which they could express themselves differently.</p>	<ul style="list-style-type: none"> - Make sure that after the break you use active work formats (because there is a big chance that the student have a sugar crash). -Make sure the students have to take standpoints so there is a need for them to discuss/talk.
<ul style="list-style-type: none"> - Students read - Students discuss in pairs - Aletta laughs - Students come up with ideas - Student let each other speak - Students don't interrupt each other - Students all speak (even though Roan less than others) <p>R3 explains the activity and the students first read</p>	<p>engaged</p>	<p>R2: The active character of the activity is definitely important in this, as it does not leave possibilities for the pupils to not participate, and again the working format is something different from what they are used to, keeping them motivated to participate.</p> <p>R3: -check if they understand -after the interviews a practical group question, works well. -The pupils can relate to the practical issues -Considering the time of the day, pupils are well engaged</p>	<ul style="list-style-type: none"> -Again, make sure that after the break you use active work formats (because there is a big chance that the student have a sugar crash). -Make sure that you use a lot of different activities and work formats, preferably a new one every time, because this keeps participating interesting for the students. - Give the students calm and clear explanations and check if they understood it, so they know exactly what to expect.

<p>the part in the booklet that is about presentations. Then they interview each other and explain to us what their interviewee has told them.</p>		<p>during this activity. - a lot of time for the pupils to read for themselves</p> <p>R1: New pairs works well and structure of the task also works well. They don't have to just talk and come up with ideas but have to answer specific questions. It works because it is different and because they are tired so it keeps them on track. If they would have thought that the other person did not represent their opinion well they would have said so.</p> <p>The interview works very well, they position themselves in another role and it is structured enough but also free enough. The open questions after are also free enough but there it is important to make sure that not always the same students talk.</p>	<p>-Provide the students with candy. This makes them happy, feel special and it cricks up their sugar level ;D</p> <p>-Make sure that there is space for all students to speak, so avoid that always the same students speak. Guide this process because in every group there will always be students that take the lead and others that stay more on the background.</p> <p>-Make sure that activities are free enough for students to give their own input. This freedom will motivate them to speak.</p> <p>-Make sure that students can relate to the activities. This will help them to come up with ideas.</p>
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Observations evaluation day

Beforehand

We think that students are engaged when:

All of them want to say something

When they take a clear position

When they react on each other

And non engaged when:

Nobody speaks/when there is no reaction

When they speak softly

When they don't take a position

We expect that the following aspects influence this:

The moment of the day (energy dip, careful in the beginning)

The room/space

Henny

Sitting with the teachers

Observations Researcher 1

In the following situations I observed either a clear engagement or a clear non engagement of the pupils. Noted are a brief description of the situation, behaviour of the pupils and the reason why they behave this way.

Input – Explanation R1

In this part R1 explains how the pupils will express their perceptions on the input of the project (booklet, use of English, etc.).

Pupils are engaged during this explanation; as R1 is talking, you can see signs with the pupils that they understand the work format and are excited to start the work format. Aletta nods frequently, sits up straight, already cleans up her notes. She also asks some questions to make sure she understands it. Roan nods as well, and feeds off the input coming from the questions of Aletta. The video is not clear on the behaviour of Simon and Linda.

The engagement is instigated by **clear explanation** of R1. The **used working format** also adds to this engagement, as it is **something different** from what the pupils are used to. (Hence the clarifying questions of Aletta)

Input – Areas of opinion

The pupils are engaged from the start. After R1 poses the first statement ("The use of English in the booklet is difficult"), pupils take initiative straight away and move into the area of opinion 'totally disagree'. As R1 is emphasizing once more that pupils are free to take their stands, both Simon and Aletta already start to express their opinion, without hesitation. Even though Roan and Linda have the option to 'freeride' on the arguments of their peers, they decide to make contributions shortly after the start of the discussion. This shows that everybody feels comfortable to participate.

One sidenote on this is that it is unambiguous whether the pupils share the same opinion, or take the same stand as this feels safer.

However, the pupils take different stands in the second statement (“without the explanation of the teacher, I wouldn’t understand the booklet at all”), showing they are comfortable enough to express their own opinion.

During the discussion of this statement, Roan, Aletta and Simon are engaged straight away. Linda holds back a bit from the start, but after a steering question of R1 (“Linda, do you agree with what they say?”), she is also fully engaged. In this case, **steering the conversation** definitely helps to engage students.

An added value to the way pupils express their opinions is a short adjustment of the working format, in which R1 **allows the pupils time to think for themselves first**, and then choose an area of opinion. This allows them to generate their own opinion without being biased by the opinion of others. Also, R1 **sums up the different opinions before asking them to share these**, to make sure the pupils are completely aware of what they want to say.

Another proof of engagement of the pupils is that all of them are comfortable enough to provoke discussions, without any steering or guidance of R1.

At one point during a discussion on whether to assign a grade to the project or not, R1 shares the struggle we (the initial designers of the project) had on this topic as well. By sharing these experiences with the pupils, R1 decreases the distance which might be present between ‘us’ and ‘them’. The pupils appreciate this, as they react to this information by nodding enthusiastically, and adding more information. This reaction can also be observed after R1 tells them how useful their input is for us, and how we can use their ideas to change some parts of the project, she makes them feel important in the design. Pupils become engaged by **giving them a sense of equality between ‘teachers’ and pupils** and by **making them feel important**.

Throughout the working format, pupils have clear opinions, take initiative in making contributions, discuss, use their hands while talking, replenish each others phrases, chuckle every now and then. This behaviour shows that they feel comfortable in the environment.

However, pupils also show signs of feeling uncomfortable. Simon always has a hand in his pocket, hangs against the table, moves his legs in a nervous way. Aletta stands with her legs in front of each other. Roan and Linda have their arms crossed in front of their bodies. Linda’s shoulders are hanging a bit forward.

This behaviour can be assigned to the **physical setup of the room (too small)** in which the working format takes place. The pupils have to move and stand in 4 different positions in the room to indicate their opinion, but the room is relatively small, forcing the pupils to move closely past teachers and peers while migrating to their area of opinion. Once they are in the area of opinion, peers and teachers (including camera) are very closeby, making their position a bit awkward and inconvenient.

Input – discussion with different perspectives

After a short introduction in this new working format, R1 hands out the four hats with different perspectives. She asks Leon to think from his perspective, the ‘lulilak’. At the same time, she puts up his hat. Leon reacts a bit hesitant. He needs some time to think, in which all eyes are pointed in his direction; he is the central point of attention. He starts to speak, but does this fairly quietly. In a sheepish way he says he does not really know an answer. It is obvious he is not very comfortable. Apparently, **the request for information should not catch a pupil by surprise** and the pupil **should not be positioned in the centre of attention**.

Then R1 intervenes, takes off his hat again and brings the activity back to the whole panel. This gives everybody time to think from their perspective, and soon after Simon explains his opinion from his perspective ('buitenbeentje'). The information he gives, seems a bit forced and unrealistic. The contribution of both Linda and Aletta is very hesitant, with regular 'uhmmm' moments. Aletta in particular ends a lot of her sentences with a question mark, and has a uncertain facial expression at times. After a bit more thinking time, without being the centre of attention, Roan also comes up with the perspective of his role. This format does not work well, because **pupils do not like to be forced into thinking from a different perspective.**

At one point, pupils start arguing from the perspective of one of the others. In this way they decide on their own perspective, rather than sticking to the perspective given to them. **Their engagement is stronger when they can choose on their own perspective.**

Collaboration & feedback – instructions

No clear observations with respect to engagement can be made in this part, as R2 is giving instructions while the pupils are listening.

Collaboration & feedback – group composition

At first, pupils are asked to think for themselves about the group composition in the project. They take this opportunity to chuckle a bit amongst each other and eat candy. They are clearly very comfortable in their position. **The relaxed approach of R2 and the clear instructions** seems to have an influence on this.

After giving the pupils a signal that they can swap from thinking for themselves into sharing their thoughts, they take their time and decide for themselves when to swap. This also indicates that they are at ease.

As the pupils are sharing their thoughts, the teachers are not really present in the process anymore and do not interrupt in their communication. The pupils talk freely and have interesting discussions which are fed only by themselves. **Giving the pupils the idea that they are not being watched stimulates their engagement.**

At one point, R2 asks the pupils to swap from sharing their thoughts in pairs, into sharing thoughts in the group. After this, a short moment of silence occurs, then Simon takes initiative saying: "Do I have to start again?". This indicates that the others were hesitant to start up the discussion, and everybody was waiting for someone else to start. Simon, being the most dominant force in the panel, starts the discussion. Shortly after, the others join in and the group discussion runs well. In this situation, letting the pupils decide among themselves who starts the discussion is not interfering with their engagement, as all the pupils are assertive enough to join. However, this approach could have a negative effect on engagement when the pupils in the panel are less assertive. **One should be careful in leaving the initiative to speak with the pupils, as dominant pupils could overshadow the less assertive pupils.**

Even though the pupils are expected to react from their personal perspectives, Aletta spontaneously comes up with a perspective from one of the roles ("..but imagine you are the 'buitenbeentje', then..."). Where forcing the pupils to reason from an assigned perspective is

not very effective, apparently the pupils automatically use the different roles in their reasoning, making the information more genuine and reliable. **It is better to include the reasoning from a different perspective in a more natural way throughout the work formats.**

In a response to the information which the pupils come up with, R2 asks the group a specific question to think about. The result of this action is that Simon starts to answer the question, and moves his focus towards R2 instead of discussing it within the group. Straight away, both Linda and Roan (the least dominant pupils) do not show much interest in the discussion anymore. **A teacher should make sure that the discussions stay within the panel.** For example: "...could you please direct your answers to the group and not to me?"

Collaboration & feedback – cooperation formats

During the 'share' activity, it is clear that the pupils lose interest. After a short time, Linda chuckles and drops down her head, indicating she is tired and is struggling to concentrate. Simon starts to talk about something which has nothing to do with the assignment, and the other pupils join the conversation shortly, even though they are still supposed to discuss in pairs. Then R2 asks the pupils to share their opinion, but after a fairly short time they are finished with the discussion. Not much initiative is undertaken anymore, and Aletta gives R2 a look which says "we are done!".

This decrease in span of concentration can be explained by the fact that at that moment, the big break was about to start and the pupils had been working for about three hours. **A fairly passive activity, such as this one, should not be performed at the end of a fairly long period of intensive activities.**

Once the break is announced, the pupils show relief in their behaviour. They become more active, chuckle, chat informally, make jokes. R2 also joins the informal conversation, making the 'distance' between pupils and teachers even smaller. **By joining informal moments, the teacher can decrease the gap between teacher and pupils, which can make them feel more comfortable throughout the day.**

Collaboration & feedback – feedback

After the break, pupils show renewed interest in the activity. They have an active posture, smile, nod while receiving instructions and start the 'think' activity full concentration. They also take their own initiative in taking the 'think' activity into the 'pair' activity, and later into the 'share' activity. In short, pupils show a difference of night and day in comparison to their engagement before the break. **It is very important to include regular breaks throughout the day.**

Output

At one point during this activity, Hennie (teamleader) enters the room and announces that we have to leave the room. Luckily, his information is not correct and we can stay in the room to finish our evaluation. This intervention does not show any effect on the engagement of the pupils, but this could have been different if we did move out of the room. **Make sure to have your location fixed.**

Considering the time of the day, pupils are well engaged during this activity. The active character of the activity is definitely important in this, as it does not leave possibilities for the pupils to not participate, and again the working format is something different from what they are used to, keeping them motivated to participate. **Use an interesting activity with an active aspect at the end of the day.**

At the end of this activity, discussions are initiated from a more plenary context, where pupils are not stimulated to participate through the active activity anymore. The pupils are not very active in participating anymore: short answers, quiet voices, less 'quality' in their answers, tired facial expressions. **Force the pupils to participate in your activities, especially towards the end of the day.**

Evaluation – instructions

No clear observations with respect to this part can be made, as R1 is giving instructions while the pupils are listening.

Evaluation – discussion

Some aspects which were mentioned by the pupils which jumped out:

How do you feel about being part of the process?

- new project, nice to be part of
- nice to do something different from school
- honour to be selected

“evaluation is completely different from what I expected but it was a lot more fun”

→ Apparently the pupils were not informed correctly, and they expected something different. Especially during the introduction, one can notice that the pupils struggle with some elements of the project as they already formed ideas for themselves. Example is that they expected the project to be about Europe and the United States, and it was not clear at all that the project is actually about making research questions. **They were biased because of incorrect information leading up to the evaluation.**

The pupils have experienced bad, boring projects in the past. They say these projects could have been better if they would have been asked to give feedback on it.

They feel useful in the process, because we listened to their input in an attentive way. They have the feeling that what they came up with, will be changed where possible.

“It is nice to have things turned around. Usually we have to listen to adults and do what they say, but in this case we have input ourselves.”

“Because we were involved in the design, I also understand a lot more of the project itself, for example why certain assignments are part of the project.”

“Now you can see how much work it actually is to make a project.”

“The use of different working formats in the evaluation made it more interesting to join and it did not get boring at all.”

“The use of variation in working formats also extracts more information as it forces us to approach the project in different ways.”

“Pupils themselves know best what they find difficult.”

“Pupils usually know how other pupils will react to a project.”

Tip: “At times we were working in pairs, but because of the other pair got disturbed in my own conversation.”

“I think this will be one of the few projects of which pupils will say it is fun and useful.”

“I don’t think that all our input will be incorporated in the renewed project, as it is quite a lot.”

Observations Researcher 2

Input –Explanation

Students watch me the table and their booklet. It shows that they listen to me full attention because **they nod** every now and then. During the explanation they start to **watch me**. They **follow the gestures of my hands** (when I point at a certain corner). It is a new working format for them and that shows because they listen carefully and Aletta **asks for explanation**. They **help me** to put the tables aside and **stand ‘ready’** when I want to start with the first sentence.

I also notice that I lean on a table while they sit on chairs, I am close to them but also a bit higher than them, but not very much. I think this shows the hierarchy. Another thing that I notice is that I say ‘laten we zeggen dat deze hoek ... is’ that makes it seem as if we are deciding something together.

I think they are turned on here because it is still early in the morning and they have a high level of concentration. It is also the beginning of the day so the ‘power structures’ are not so clear yet. They play safe and choose to position themselves as polite and quiet students. (in Dutch ‘de kat uit de boom kijken’). I also think they are turned on because it is a new working format and they are curious about it and they like it to feel part of something important.

Input- corners with opinions

The students walk all to the same corner pretty **straight forward**. Only Linda seems to hesitate a little, she walks to the same corner a bit later. They **start telling me immediately** why they are standing in that corner (I didn’t even tell them to). That shows they are turned on! And that they **want to share their opinion** with me. With the first statement they all say something, but it already shows that Simon and Aletta say a bit more and that Roan and Linda are a bit more on the background. Later I make sure that I listen to all of them. Linda stays for example in the same corner and I ask her ‘so for you it is just clear?’ and then she replies with ‘yes’ and a **smile**. She is turned on but doesn’t say so much.

To make sure that the students influence each other’s opinion too much I give them new instructions and tell them that they should first take some time to think and then walk to the right corner. I reformulate their statements to make sure that I understood them and they are turned on because they **say ‘yes’ and nod** and **add some information**. The title, Roan immediately looks and Aletta says: ‘the US EU and YOU’.

We have some little misunderstandings about which corner represents which opinion and Roan feels **free enough to say that it is a bit confusing** . Has to walk to another corner. They

also start to **explain (and argue) to each** other which corner represents which opinion. They **react quicker and quicker** on each other and **go against each other** to explain their opinions. They are clearly turned on because they **don't wait for a sign** of me to speak. I just wait and let them discuss about getting a grade or not.

Aletta also **adds information** when I repeat her opinion. "I think the enthusiasm is good, but you should make it a bit shorter" she tells me. I ask the three students to convince Simon who is standing in the opposite corner. **They smile but it is a bit scary too, they start carefully.** Simon **asks for clarification** because the question is not clear to him.

The work format really makes the different opinions of the students clear and I have the impression this really motivates them to speak because they want to defend or explain their opinion to the person who is standing opposite them.

Input- Discussion with Hats

It is a bit scary for Roan to speak in the person of the 'lulak'. The other students **laugh** when I put the hat on his head and they tell him 'what do you think yourself, speak out of experience'. He doesn't seem to like it. They laugh a little about the hats and **none of them puts the hat on.** I start with Simon (because he is the one that seems to be least afraid). He really speaks from the character (buitenbeetje). Linda finds it more scary and **speaks very quietly.** She **makes her body small** and doesn't speak from the character but **about the character** ("I think he..."). Aletta starts with 'eh ja eh' and 'ja eh misschien ja eh ik weet niet' also showing that she is not very confident or doesn't know exactly what to do. But they all try very hard so it is not that they don't want to. She also says that she thinks everything is good. That means she **doesn't take a clear position.** The others help her.

Analysing what happens here I think that this work format does not add so much because they already said everything they wanted about the 'input' in the corner game. So it feels as if it doesn't add so much. On top of that they don't feel safe about it. It might have helped if we did it before so they had an example and noticed that it was fun.

Collaboration- Explanation

R2 also speaks in 'we' (we kunnen misschien het beste even door het boekje heen bladeren), which creates a team feeling. Quite similar to what I wrote above. Sits with students but leans on table so a bit higher. They go through the booklet together. Quite some **sweets are eaten.** I think that it turns them on even though it also distracts their attention perhaps a little bit. Aletta **asks for clarification.** The fact that R2 made notes on the board also helps. He focuses their attention and keeps them with the explanation.

So I think they are on during the evaluation because of the sweets, because of the text on the board and because the way R2 sits with them and uses his voice/body.

Collaboration – Group formation

R2: Is that clear for everyone. Yes and they nod.

We are not so on top of them when they are **discussing amongst themselves.** That also seems to work. Some freedom. Maybe also time of the day. We can now let go a bit and they are getting a bit **tired.** Later they tell us they are too close from each other. I can notice

this on the video. The noise is a bit distracting. It doesn't turn them off but they **speaks a bit softer** (Linda and Roan)/**or louder** (Simon).

Then they have to share their information. It works very well because they already spoke with their partner and therefore feel more confident to share their information with the group. Danger is that **same person begins every time** (Simon, he also says: do I have to begin again?). So make sure the teacher steers this format so that everyone has the same chance to speak. I also notice that Roan **almost doesn't speak** during this task. He is with it, but **the others are just quicker or louder**.

*Analysing the above I think this format works and motivates the students. It is important to do it at a moment on the day when they can handle some **freedom**. However, in this format it is also really important that the teacher guides and sometimes gives a turn to those students that are not so present in the group. Otherwise some of them might turn off.*

Collaboration –Working together

With the task 'think for yourself' it is rather difficult to check if the students are turned on or off, at least if they don't make notes. **Pair changes automatically in share**. That is interesting. Probably it happens because they sit so close to each other that they hear each other all the time. If you want to avoid this it is again better to set them apart. In our context it was no problem. Energy level is not very high but it is almost the break so I think that they are **tired**. Henny walks in. Aletta **smiles** and the students **sit up straight**. They are maybe a little **anxious** but it does not disturb the situation because they are not working. Except that same things as before.

Collaboration – feedback

After the break there seems to be a **sugar crash** but R3 quickly provides them with soda to crick up the sugar level again ;-). She uses the names and that works well. Linda didn't mention herself that she wanted to drink something but when R3 asks her she tells her she would like some 7-up. Because Simon is more quiet Linda and Roan **speaks more**. Or maybe they just have a different energy level.

Now they like it to imagine what the different roles would think. They smile and have some **clear ideas** of what the person in question (de betweter for instance) would think. So apparently the roles do work but it really depends on how and when you use them. R2 says, so that means we don't have to change something. Or should we change something to make it better? They say 'no' and look down. I think they really find it good the way it is but that they also say no because they are **tired**. Always ask open questions!

Output

R3 explains and they start with reading. Meanwhile Henny comes in to ask us something, but they **don't seem disturbed**. Everyone still seems a bit **tired**. I don't think it is because of the work format, I think it is because of the time of the day. It would have worked better to use something active now or another format in which they could express themselves differently. R2 asks if they want to sit differently so they are not so disturbed by the conversation of their neighbours, but they say it is fine the way it is.

New pairs works well and structure of the task also works well. They don't have to just talk and come up with ideas but have to answer specific questions. It works because it is different and because they are **tired** so it keeps them on track. Aletta **laughs** and says to Roan: 'Haha thank you for the interview'. She does like it to position herself in the shoes of the interviewer but also thinks it is a bit strange to make it too artificial.

They **let each other speak and don't interrupt** or add information (Dutch: ze vullen elkaar niet aan). Therefore I think it works well. If they would have thought that the other person did not represent their opinion well they would have said so. Then after 'free' conversation about the question: "Hoe zouden jullie zelf de muziekgeschiedenis van Amerika en Europa in een film kunnen laten zien?" This works well, **they all speak**. Roan **doesn't speak much**, but he does say some things.

So after break active work format works well. The interview works very well, they position themselves in another role and it is structured enough but also free enough. The open questions after are also free enough but there it is important to make sure that not always the same students talk.

Evaluation – Explanation and Discussion

I give them a compliment and Aletta laughs. It speaks for itself but I think that to make the students feel valuable really helps to get good output from them. They say also: it feels like an honour that we are chosen. Positive they think that we listened very carefully to what they said. They really got the feeling that their knowledge added something and that we will change things because of them. "Normally we have to listen to adults and do the project but now can actually influence it (hebben we iets inbrengen)". Very usefull to listen to students, after all we are the ones that have to do the project. Only talking would be boring. Lots of working formats keeps it interesting.

I think they are turned on during the evaluation because they know it is the last assignment, because they feel honoured and because it is some personal feedback.

Observations Researcher 3

Corners and Statements

On:

- calm and clear explanation
- clear what will be done and what is expected of pupils
- the pupils are really listened to: R1 asks for clarification if pupils answer, nods her head, asks them to convince each other, rephrases answers
- different corners really show different opinions and make discussion easier
- letting the pupils discuss amongst themselves without interference
- the pupils can move around, it is very active

Roles and Hats

Off:

- pupils have to explain how the hat/type given to them would respond, they find it difficult and do not have a clear answer
- explanation is quite short, pupils are a bit overwhelmed with the exercise

- the topic is the same as the last round and there is not a lot of time in between, nor is it clear in the explanation a new part of the evaluation started
- at first the pupils do not have time to think their answer over and Roan does not respond, when given more time they have more answers (but still not much more than obvious clichés)
- after the corner game this exercise is very passive

Cooperation – Groups and Pairs

On:

- clear explanation
- candy
- think, pair, share
- small steps, each step is explained carefully
- time for questions, each question the pupils have is answered elaborately
- pupils are given time and space to discuss amongst themselves, we are not interfering and do something else
- discussing in pairs really works: everyone is listened to
- very relaxed atmosphere
- we ask the pupils if they need more time or not: the pupils decide the time slot
- we let the pupils discuss with the four of them without us interfering, they have a lot of space as we do not steer the direction of the conversation > really works I think!
- open questions work well, as does asking for clarification

Cooperation – Working together

On:

- let pupils think for themselves before discussion starts
- we do not interfere and are doing other stuff
- candy...
- pupils have a lot of time to think
- school provides lunch
- explanation is very clear and step by step
- we are definitely at ease; eating, drinking, laughing the atmosphere is very relaxed
- pupils use the roles from the earlier work format without us asking for it
- a lot of space for the pupils:
 - o they may think and talk as long as they want
 - o we respond positively to their answers (yes, great, alright, thank you, nodding, hm hm)
 - o the pupils feel listened to: we ask them to clarify their answers, we rephrase their answers)

Output

On:

- calm, clear explanation
- pupils discuss in pairs
- candy
- a lot of time for the pupils to read for themselves
- check if they understand

- after the interviews a practical group question, works well. The pupils can relate to the practical issues

Off:

- after lunch they are tired
- the format does not give room for an open discussion (interviews in pairs)
- no clear statements, so no discussions (more about their personal preference, so no need for discussing)

End Evaluation

Pupils say:

- diversity is very important
- they feel honoured and important
- good to feel listened to
- good to feel we have something to add

General ideas on why our day was a success:

We give them a lot of positive feedback during the day, are at ease ourselves, give them as much time as they want, respond positively to their answers, have a great diversity of working formats, let them think for themselves before discussing something, make them feel listened to, explain each section of the day step by step, explain the underlying ideas of the day: Why did we do something in a certain way? What is it we want from them?

Bullet point conclusions

Guidance

- Keep the atmosphere relaxed.
- Do not interfere as little as possible with group discussions.
- Make the students feel at ease by joining informal conversations.
- Make the students feel at ease by providing drinks or food or sweets.
- Make the students feel at ease by giving them positive feedback.
- Rephrase what the students say and ask them for clarification so they feel listened to.
- Steer the conversation to start up quieter students.
- Make sure that the students feel important, by telling them how valuable their opinions are for you.
- Make sure the students always feel comfortable/Make sure you don't put the students in a position in which they feel uncomfortable.
- Be friendly and open towards the students.
- Involve the students that are not participating actively.
- Ask open questions.
- Stimulate the students to think and answer elaborately.
- Make sure that there is space for all students to speak/avoid that always the same students speak.

Work Formats

- Active work formats invite participation.
- Little teacher interference can enhance students' participation.
- When used eloquently, different roles can be useful to create different perspectives.
- Diverse work formats keep the students engaged.

Learning Environment

- Make sure you have a spacious working space.
- Make sure you have a working space where you will not be disturbed.
- A small working space can be an advantage when switching from pair to group work.
- Provide the students with drinks/food/candy. This makes them happy, feel special and it cricks up their sugar level.
- Make sure the students have enough space to do their activities.

Instructions

- Take your time to explain what you are going to do.
- Be calm while you give your instructions.
- Give an example to break the ice.
- Use a black/whiteboard or other tools to explain clearly to the students what they will do.
- Check if the students understood the instructions. So make sure the students know what is expected of them.

Time Management

- take the time of day into account by putting the most activating work formats at low energy moments.
- Low energy moments are at the end of the morning, at the end of a long activity, right after a long break, and at the end of the afternoon.
- Less activating work formats may be done at high energy moments, such as the beginning of the day or just after a short break.
- Short, regular breaks keep the students engaged during the activities.
- Listen to the students (and their body language) to decide whether an activity has lasted long enough.