

## **Conscientisation and codesign in secondary maths**

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We are students and a teacher from a maths class at a secondary school and we have been working on a research study together over the last year where the teacher and students work together to make changes to lessons. Our report is going to look a bit different to normal conference papers because we are writing it together. We show you some of our ideas and explain how we came up with them. This includes conscientisation (exploring and understanding problems) and codesign (making changes together). We think that maths can be learned in different ways and it is important to discuss our ideas and experiences.

**Keywords: codesign; conscientisation; dialogue; cocreation**

### **Introduction**

We are Karen, Shannon and John, we are the students of a secondary school and we are part of the research study which is done by Mrs Goodland. We are in year 10 and we haven't enjoyed maths in the past (we like it now!). And I am Mrs Goodland, I am a maths teacher and a researcher. Our report is going to look a bit different to normal conference papers because we are writing it together – not just the researcher. We have been working together on the research study across the last year and we planned our conference workshop together. We want other teachers and researchers to see our ideas and see how we feel about the research.

The aim of the research study was to try and take a 'codesign' approach where the students and teacher were designing maths lessons together. We looked at what was holding us back from doing well in maths and this helped us to think about what sorts of things we wanted to change. The main problems that we identified were around testing, feelings and starters. We spent time thinking about these problems (we call this conscientisation) and then we made some collective changes and decisions (codesign). We introduced a check-in? process, added more creativity and variety to our starters and tried alternative forms of assessments.

We have chosen to write this report together because we think it is really powerful when teachers and students co-create something together. We have different roles and perspectives and when we come together and share these perspectives we can create something special and unique that brings together our different experiences and ideas. We decided on the structure of the report together and we have written the text together.

### **Background Theory**

Mrs Goodland chose to use a codesign approach because she felt that maths lessons needed to be more inclusive, interactive and relevant to students, but felt that she needed to work more closely with students if she was going to achieve this. She

thought that perhaps if the teacher and students worked together to decide on what changes to make, it would be more meaningful for everyone.

The idea of being trapped in a system and then trying to work together to achieve change aligns with Paulo Freire's work in *Pedagogy of the Oppressed* (Freire, 1970). Freire talks about oppression (characterised by possession, domination and objectification) and liberation from oppression (a process of becoming more fully human). He says that teachers and students must work together to achieve change. This process involves reflection and action (Freire, 1970) – we call this conscientisation (exploring and understanding the problem) and codesign (making changes together).

### Part 1 – sharing some activities

First, we want to take you through some of the things that we do in our lessons. We think it is important that you see the actual ideas we have come up with, so that you could try it for yourself. Here is a summary of a typical lesson:

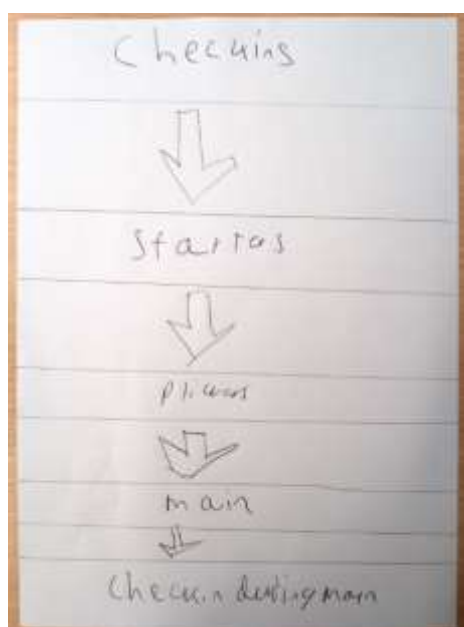


Figure 1: Checkins → Starters → Plickers → Main → checkin during main

### *Checkins*

We want people (especially Mrs Goodland) to know how we feel every day. So when we come into the lesson Mrs Goodland asks us if we're OK or gives us a checkin sheet. She needs to know that in case we're feeling sad or depressed. If we're not OK, she tries to find a way for us to start the lesson more gently.

Figure 2 is a picture of our checkin board (some of us add post-it notes with our names on to say how we are feeling) – and our checkin notes (some of us use these to write how we are feeling).



Feelings: Happy/enjoying myself, bored / can't be bothered, noisy, ok/fine, tired/ill, distracted, overstimulated, anxious/nervous, crash out / angry, sad, nonchalant, other

How is your day going? / Do you understand the work?

Figure 2: Checkin board and checkin notes

### Starters

We prefer starters that are more varied and creative. Earlier this year and in previous years, we were doing mixed questions and times tables every lesson and it was too repetitive. We decided to do a wider range of different starters with a focus on creativity and interaction.

For our new starters, we do investigations, wordsearches, treasure hunts, blooket<sup>1</sup> and games. Figure 4 shows two examples. We want you to see our starters because they're different to what the other classes do. We also do a plickers<sup>2</sup> quiz – we want other teachers and researchers to see this because it's a creative way of learning and it shows you can learn by doing something more creative. Some people still like doing the old starters – everyone is different and we have different choices for everyone.



Figure 3: New starters (wordsearch and matching pair cards)

<sup>1</sup> Blooket is a website with interactive competitive quiz games: [www.blooket.com](http://www.blooket.com)

<sup>2</sup> Plickers offers interactive multiple-choice quizzes for classes: [www.plickers.com](http://www.plickers.com)

## Main

In the main parts of our lessons, we do different activities that are fun. We often do these activities in groups. We have a small class which we like because then we have people in different groups but it's not too many people and it's not too noisy. We moved the tables and the seating plan to fit everyone's needs and also so that we can sit in friendship groups where we feel safe. Our arrangement is different to the other classes and to what we had before. We're all in different sized groups. Sometimes we talk to people in other groups too. When Mrs Goodland is working with us she is part of our group. We like doing activities where you move around, like shapes on the floor, big probability scales and treasure hunts. We also check in during the lesson, and the teacher asks us if we understand the work or not.



Figure 5: Our desk layout

## Assessments

When we do assessments in lessons, instead of doing a normal test, we split the test up so it's less stressful. We also tried using google form quizzes, blooket, posters and presentations. Some of them were better than others and suited different people. Overall we found them less stressful.

## Part 2 - how we go to this point

Now that you've seen some of the things we do, we are going to explain to you how we came up with these ideas. Part of this is conscientisation (exploring and understanding the problem) and part of it is codesign (coming up with ideas and making decisions together).

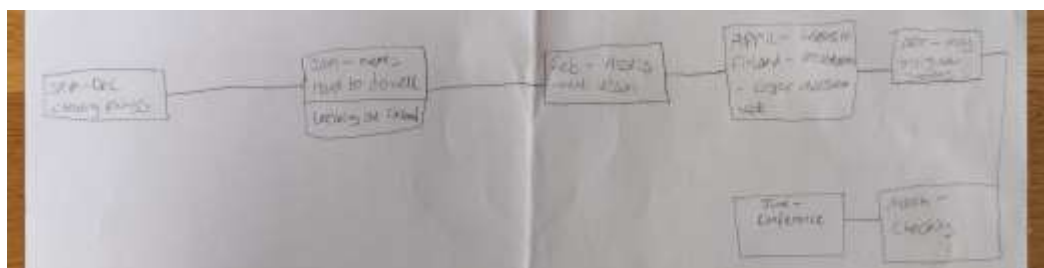


Figure 6: A timeline of key activities over the year:

Sep-Dec: creating things → Jan – memes, what makes it hard to do well, looking at Finland  
→ Feb – assessment lesson → April – letter to Finland – presentation – Easter assessment week  
→ April-May – trying new starters → March – checkins → June – conference

## Assessments

We did activities throughout the year on people's ideas in maths. One of them was about the problems we experience in maths – we were given a pack of different cards and we had to move them around based on what makes it hard to do well in maths:

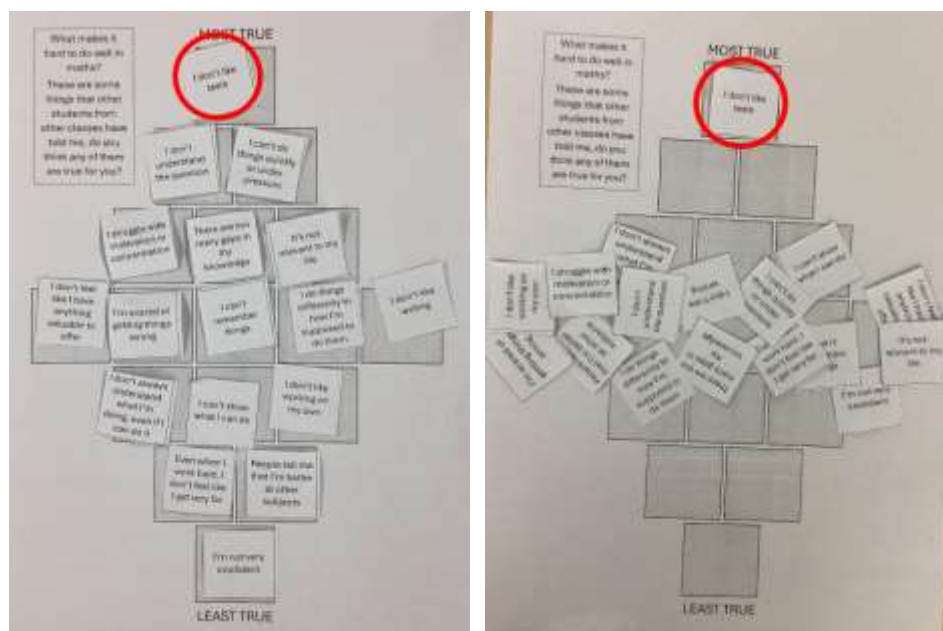


Figure 7: How students laid out the cards

We picked out tests as a problem. We had a conscientisation process where we thought about the problem and tried to understand why it is a problem. We spent time trying to figure out what we don't like about it. We looked at pictures and memes and came up with words around tests. We learned about how in Finland, they don't do standardized tests. Learning about Finland changed our way of thinking about tests. Before, we thought we just had to do tests, but we don't, and we thought about different ways we could do an assessment, and we changed the way we do our assessments so that they are less stressful, but it also shows what we've learnt.



Figure 8: Some memes about tests

We also emailed a Finnish maths teacher to ask him some questions about maths education in Finland, and gave a presentation to the head of maths explaining how we felt about tests and what we thought we should do instead. The head of maths could see how stressed and overwhelmed we felt by tests and was happy for us to try some alternative assessments as long as we did some of the test questions. We came up with some alternative assessment ideas (described above) and used these instead of the normal class tests in February and April.

### ***Checkins and starters***

The students came up with the idea of having a checkin. We found a problem which was that sometimes, students are very distracted. We looked at how people felt on different days and whether it was linked to how distracted they were. The students liked exploring how they felt and they said that we should check in at different points in the lesson so that we are aware of how each other feel. Talking about how we felt at the beginning of lessons made us reflect more on the starters. This is how we came up with the idea of having more varied and more creative starters.

### **Questions**

At the conference, people who took part in our workshop asked us some questions. Here are our joint answers:

*1. How are the school dealing with this?*

The school don't really know much about it and have just left us to it.

*2. Is your class a particular ability group?*

Yes and no - we're actually quite mixed, although we're not too different. We don't want people to think of us differently because we're in the bottom set, because we're just the same as everyone else.

*3. Does it take the teacher a long time to prepare all the different resources?*

We actually make some of the resources together. It can take a bit longer overall but it doesn't really take the students or the teacher very long.

*4. What are the students like in other subjects?*

We're generally quite similar in other lessons – what we are thinking and feeling might be different depending on whether we like the lesson, but we usually behave in a similar way. We might chat more or less depending on what the teacher allows.

### **Conclusion**

Other teachers could try what we've done and see if it works for them and their classes. Our advice would be to start with the ideas that we have suggested (especially the checkins) and then if that seems to be working, you could try the full project where the teacher is researching with students and everyone is coming up with ideas together. Sometimes in our research study, Mrs Goodland was doing the research, but sometimes we were doing the researching together. For example, looking at Finland, doing the presentation to the head of maths, writing this paper, and planning our conference presentation are examples of where we were doing the research together. We liked all of it, but we especially liked working together. Our key message is that maths can be learned in different ways – the world is changing and so is maths! We also want you to know that working in groups is better than working by yourself, and it's really important to listen to students and understand what it is like for them.

### **References**

Freire, P. (1970). *Pedagogy of the Oppressed*. New York: Seabury Press.