Collaborative group work

Assessment resources for schools

Our researchers teamed up with the
University of Cambridge to find out
about good classroom collaboration

AQA
Realising potential

These resources are the result of collaboration between our Centre for Education Research and Practice (CERP) and the Faculty of Education at the University of Cambridge.

Contents

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Introduction: evaluative framework

Young people spend increasing amounts of time collaborating online, but the skills involved in face-to-face collaboration are as important as ever, particularly in the workplace.

Use these resources to assess classroom collaboration among student groups, ideally 2-5 individuals. These are based on our research evidence about behaviours we might see in successful collaborative work.

Features of collaboration

The lists below show the main features of more successful and less successful collaboration consistently seen in our research work.

A student participating particularly well is likely to demonstrate more 'good' features, or demonstrate them more consistently.

A student participating well might:
- create the feeling of a group and ensure all are involved
- help to establish a shared focus for the group
- keep the group moving forward: directing and structuring the activity
- demonstrate persistence
- praise others
- bring humour to the task
- engage with the task – signalled through physical action and verbal feedback
- propose ideas and justify them with reasons; explaining rather than just asserting
- invite ideas from others, building on them and challenging them
- ask questions to guide action or to clarify ideas of others
- use inclusive language eg 'shall we?'
- echo the language of others.

A student participating less well might:
- take and retain control of the task, take a position of authority, dominate or command others
- talk in a monologue and build on their own ideas only
- exclude another member of the group or dismiss their ideas
- withdraw physically from the group, work alone without verbal explanation of actions
- defer to another member as the authority
- give a very low or high number of utterances relative to the rest of the group
- offer few ideas and invite few from others
- demonstrate a high number of disagreements that are not resolved.

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Suggestions for using these resources

- Observe a group doing a collaborative task and record collaborative features demonstrated by one or two students.
- Work through the list of features of good participation, discuss it with students, then use for self and peer reflection during or after a group task.
- As above, but students make their own list in their own words and agree its features as a goal for their group.
- Use example materials to discuss features of good participation with students. Use specific questions to guide the discussion, for example:
    - Why does student 1 ask this question?
    - How does student 2 show engagement/focus and willingness to contribute?
- Focus on a small subset of features for a particular group task. For example, focus on how to show listening and engagement, or focus on giving reasons for ideas.
- Observe a group doing a collaborative task before and after a discussion about the features of good participation.

In all of the above, consider the most effective way to feed back. It should be:
- specific, (tied to actual evidence of behaviours)
- informative, (not judgement based but explicatory)
- supportive/constructive, (offering suggestions for amendment which are achievable and appropriately differentiated).

We've provided sheets for recording contributions to the group work. They're designed for a single student, but can be used for up to three if appropriate.

Individual observation record sheet

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Individual observation record sheet

Initial details

- Teacher name:
- Student name(s):
- Group:
- Date:
- Task:

Successful collaboration	Observed		
	Student 1	Student 2	Student 3
Contributes to group cohesion and focus			
Keeps the group moving forward			
Persists with the task			
Praises others			
Brings humour to the task			
Engages in the task			
Proposes ideas and justifies them with reasons			
Invites ideas from others, builds on them and challenges them			
Asks questions to guide action or to clarify ideas of others			

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More successful collaboration cont.	Observed cont.		
	Student 1	Student 2	Student 3
Uses inclusive language such as 'shall we'			
Less successful collaboration	**Observed**		
	Student 1	Student 2	Student 3
Takes and retains control of the task, takes a position of authority, dominates or commands others			
Talks in a monologue and builds on their own ideas			
Excludes another member of the group or dismisses their ideas			
Withdraws physically from the group, works alone			
Defers to another member as the authority			
A very low or high number of utterances relative to the rest of the group			
Offers few ideas and invites few ideas from others			
A high number of disagreements without resolution			

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Group observation record sheet

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Group observation record sheet

Initial details

- Teacher name:
- Student names:
- Group:
- Date:
- Task:

Here are some group level features that you might see in more successful and less successful collaboration. You can use the middle column to indicate how successful the group is for each feature by placing a tick further to the left for less successful groups and further to the right for more successful groups.

Less successful collaboration						More successful collaboration
Group is not cohesive						Group is cohesive
Not all are focused on the task						Group members have a shared focus on the task
Not much talk overall						Enthused and excited talk/playful talk
Little sharing of knowledge and few reasons given						Sharing knowledge and offering reasons
Uneven dynamic – one member is dominant or marginalised						Balanced – all members active
Talking over each other/not listening						Contributions of all members valued
Lack of awareness of group needs						Showing sensitivity/awareness of how to make the group work well
Physical withdrawal/lack of eye contact						Inclusive use of gesture and posture

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Notes on group characteristics

Notes on the quality of the outcome of the task

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Group ground rules

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Group ground rules

We will try to:	We will try not to:

Self-reflection sheet

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Self-reflection

Think about these features of good participation. Were you able to do some of these things in your group? Which three do you think you did the best? Which one would you like to do more of next time?

Good collaboration	Tick the three you think you did best – choose one target
I made sure everyone was involved.	
I made sure everyone understood the task and the steps we needed to take.	
I kept the group moving towards the goal.	
I persisted with the task.	
I showed I was listening and thinking; that I was engaged in the task.	
I praised others.	
I suggested ideas and justified them with reasons.	
I invited ideas from others	
I challenged others' ideas with reasons.	
I built on others' ideas.	
I asked questions to make sure I understood what others were saying.	
I used inclusive language such as 'shall we?'	

Write a target for yourself.

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Peer reflection sheet

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Peer reflection

Think about these features of good participation:

- Were the other members of your group able to do some of these things?
- Which three do you think they did the best?
- Which one would you like them to do more of next time?

Good collaboration	Tick the three you think they did the best. Choose one target.		
	Student A	Student B	Student C
Made sure everyone was involved.			
Made sure everyone understood the task and the steps we needed to take.			
Kept the group moving towards the goal.			
Persisted with the task.			
Praised others.			
Brought humour to the task.			
Engaged in the task.			
Suggested ideas and justified them with reasons.			
Invited ideas from others.			
Built on other's ideas.			
Challenged ideas of others with reasons.			
Asked questions to clarify ideas of others.			
Used inclusive language such as 'shall we?'			

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Appendix

Example videos and transcripts

Click on the title to skip through.

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Collaborative group work

Example videos and transcripts

Example of persistence

Here is one example of persistence in group work taken from our research observations. You may see persistence demonstrated in other ways.

Watch the video, here: Clip A – Persistence

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this clip the students are stuck on how to make the robot stop when it detects a red line. They collaborate to work out how to solve the problem and persist until they have worked out what is going wrong. Student A2 takes the lead but all are involved.

Student A2 is moving between the robot on the mat and the computer table, while student A1 remains seated at the computer and is in control of the mouse throughout. Student A3 stands and also moves between mat and computer. There is a feeling of shared endeavour as they are all engaged with the task. When it doesn't work as they expected they persist in trying different numbers until it works. There is a sense of pace throughout as they all make suggestions, and collaborate to move forward with the problem solving.

Transcript

Speaker	Speech	Commentary
A2	Um it's plugged in now, this is white. What's that?	
A1	It's not working I'll have another go ok So white is um 70.	A1 Sitting at the computer concentrating on what is on the screen. A3 comes to sit next to her and is also concentrating on the screen.

Speaker cont.	Speech cont.	Commentary cont.
A2	This is red.	A2 is sounding confident.
A1	Um yeah no that's 74?	A1 is sounding hesitant and phrases this proposal as a question.
A2	How is that 74? That should be red.	A2 now sounding much less sure.
A1	Is that red are you sure?	A1 looks puzzled and asks for confirmation.
A2	That's red.	Confirming this assertively.
A1	Are you sure it wasn't registering the table when we did it up here?	Directed at A3 who gets up to check the robot then moves back to the screen.
A3	That could have been the case, the tape is quite see through.	Agrees with A1 and backs this up with a reason.
A2	Ok and if you wait a second this is black - yes this is black.	Ignoring A3 and overlapping talk turns.
A1	Yeah no that's down 10 digits.	A3 moves back to the screen next to A1.
A2	Ok and this is red again?	
A1	No that's 80.	A1 still focused intently on screen and A2 intently on robot.
A2	So it increases! That's what the problem is then.	
A1	So if I make that 80 instead of 30.	A1 looks up to try to make eye contact with the other two to check this is the correct course of action.
A3	OK.	
A2	Yes make that 80 instead of 30 and then try and download it again.	

Speaker cont.	Speech cont.	Commentary cont.
A3	Make, make, make it bigger, you want it bigger than 30 .... bigger than 80, bigger than 80.	Leaning over and pointing at the screen.
A1	Why?	A1 is challenging A3.
A3	Because it goes up.	A3 justifies this with a reason.
A2	So make it bigger than 70!	A2 makes an alternative suggestion.
A3	Yep.	
A2	No make it bigger than 75 because white is very close to that.	A2 builds on her previous suggestion and gives a reason.
A3	True.	
A2	Try 75 and see if that works, it might not.	A1 is in control of the computer with A3 standing back a little now and A2 leaning in. A2 is driving the problem solving forward. A3 is a little marginalised. A2 is still unsure of her suggestion but they download the instructions to the robot ready to try it out.

Collaborative group work

Example videos and transcripts

Example of humour in collaborative group work

Here is one example of using humour in group work taken from our research observations. You may see humour demonstrated in other ways.

Watch the video, here: Clip B – Humour

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

This group is characterised by student B2 taking the lead and this extract illustrates how humour can help to keep all participants involved in the discussion. This in turn can make it more likely that the problem solving is collaborative.

In this clip the students are continuing to solve the problem, with student B2 in the centre and directing the activity. B1 is included but B3 is not included as much and used humour to try to become more involved in the discussion. They are bantering as they work but are not really distracted from the task by this humour.

At the start of this clip, B1 is at the mat trialling the robot and then moves back to the computer where B2 is seated and in control of the mouse. B1 and B3 then sit either side of him. B2 turns towards B1 at times when checking he's doing the right thing, but only turns towards B3 when they are engaging in the off-task banter.

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Transcript

Speaker	Speech	Commentary
B2	Alright so we need to... make it turn right after that don't we?	B2 is in control for most of this group's session. He sits in the centre and controls the computer. The other two are trialling the robot on the floor then come and sit either side of him.
B1	Yup.	
B3	Go on for a little bit though.	This is dismissed by B2 but then picked up when built on by B1.
B2	Yeah yeah yeah.	Said in a jokey voice.
B1	The slightest longer bit.	
B2	About like, 2 seconds? No not even…no a second?	B2 turns to look at B1 when asking this. This effectively excludes B3 who is sitting on his other side.
B1	No, one. yeah.	
B2	Move…tank…	He is narrating what he is doing.
B1	Sorry can I just put that there?	B1 deferring to B2 and leaning across him to place the robot in the centre rather than hold onto it himself.
B2	Thank you.	
B1	Wunderbar.	
B2	Wunderbar! That means wonderful in German!	They start to joke and talk off-task here but continue to work through the problem during the banter.
B1	Yeh I just learnt that like two weeks ago!	
B2	Really?	
B1	[Laughs] I've been learning German for three years!	

Speaker cont.	Speech cont.	Commentary cont.
B3	Well I learnt it just now!	B3 is included more when there is humour.
B2	Um, so we'll put it at 50 and 49.	
B1 &2	490!	B1&2 speaking simultaneously.
B3	Nein! See I am learning.	They pick up on the pronunciation of 'nine' and 'nein'. Again B3 wants to be included and uses humour to try to be more involved in the conversation.
B2	Yeah you are learning German	A slightly patronising tone.
B1	You're getting good at Deutsch.	
B2	Just for a second.	
B3	Deutschland.	Again B3 trying to keep the joke going and stay included.
B1	Yeah.	
B2	and then we'll have to steer it to the… turn it right? Yeah? Yeah? Yeah?	Again B2 is turning to look at B1 when asking this. 'Yeah?' is in a jokey voice.
B3	Yeah.	
B2	Yeah?	
B2	Um so we would have to	
B3	Stop one.	B3 gives a suggestion but is talked over.
B2	Cut all the right engines and	Here he talks over B3 who tries to make a suggestion.
B3	Or make it go backwards!	This suggestion is also ignored.
B1	No cut, yeah sorry you're right.	B1 is listening to B3.
B2	Cut the right engines .	B2 carries on with his idea.

Collaborative group work

Example videos and transcripts

Example of establishing a shared focus

Here is one example of establishing a shared focus taken from our research observations. You may see this skill demonstrated in other ways.

Watch the video, here: Clip C – Establishing a shared focus

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Commentary

This is the very start of the session and the girls are working out how to begin and are all talking, often overlapping in their talk. They are all standing at the table where the robot is. There is lots of eye contact with all three engaged in deciding how to proceed.

There is consistent use of inclusive language such as 'we' right from the start, which helps to establish the shared focus of the group. Ideas are phrased as questions and suggestions by using modal language such as "we could".

Transcript

Speaker	Speech	Commentary
C3	Start with a timer.	
C1	A timer?	
C3	Yeah, because, if we have it, like, going this way, then this [00:00:25].	C3 is establishing the group by using 'we'.
C1	We could do the number of rotations.	C1 phrases an idea as a suggestion by saying 'we could' – this establishes that it is a shared decision.
C3	But, if we like do it…20…	C3 is building on C1's proposal.

Speaker cont.	Speech cont.	Commentary cont.
C1	Yeah, because 20 rotations-	Echoing C3 and building further.
C3	Is that [00:00:33]?	
C1	Or we could do it until it detects this shade of [00:00:38]. This black line.	C1 is disagreeing with C3 but again uses 'we' to make this a joint decision and uses 'could' to phrase it as a suggestion.
C3	((Turns milk model))Yeah.	
C2	It's not going to work [00:00:44].	
C3	It's still going round.	C3 is agreeing with C2 and building on this.
C1	So… so we're going to start from here ((pointing to area on table)). How do you want to get to that?	C1 asks a question to include others in the decision.
C2	Do you have to get past that and then pause ((pointing to area on table))?	
C3	I think we should just do, like, number-	
C1	So do we do rotations or a timer?	Again an idea is phrased as a question.
C3	We'll see which one works better.	Continued use of 'we'.
C2	Rotations.	
C1	Rotations, OK. So how many rotations do you think the first go will be? We could do about 10 rotations to see if it works.	Echoing C2 and asking a question and again using 'could' to move the problem solving forward.
C3	What are you doing? (to S2)	Said with humour.
C2	*((Measuring distance with hand on table))*7.	C2 looks up and smiles.
C1	7	Echoing again.
C3	No, I think-	

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Speaker cont.	Speech cont.	Commentary cont.
C1	Yeah so let's try 7 rotations.	'Let's try' indicates an inclusive approach even when making a decision.

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Example videos and transcripts

Example of keeping the group moving forward

Here is one example of keeping the group moving forward provided taken from our research observations. You may see this demonstrated in other ways.

Watch the video, here: Clip D – Keeping the group moving forward

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this extract the group is running short on time and trying to get one last trial completed. D2 is seated at the computer and controls the mouse. D3 sits next to him holding the robot and D1 stands, leaning across the table to see what is happening on the screen. Once they download their latest code onto the robot D3 gets up to trial it on the mat.

All are very smiley throughout the session. They are encouraging each other and also challenging each other's ideas until they get the right course of action. When they disagree it is productive and keeps them moving towards their goal.

Transcript

Speaker	Speech	Commentary
D3	One more run. Come on. Come on.	D3 is keeping the pace going by encouraging others as they are running out of time.
D2	[00:08:23] 85.	
D3	What was it before ((sits down, plugs robot in))?	
D2	It was 80.	
D3	I don't know if that's going to be enough. Say 90.	

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Speaker cont.	Speech cont.	Commentary cont.
D2	90 ((clicking on mouse)). And then how many rotations?	Although D2 is at the controls, all three of them are very engaged with the task.
D1	Uh, so ((pointing to screen)).	
D2	How long did it last?	
D1	Oh yeah. It was kind of close I would do like 8.	
D3	Why would you do less?	D3 challenges the idea.
D2	Cos it went too far.	D2 gives a reason.
D3	Oh, OK. I didn't look very...look too	
D1	[00:08:55].	
D2	((Clicking on mouse, download noise)).	
D3	((Unplugs robot, takes to floor mat quickly, presses buttons))((To X)) Can you put the box down? ((Places robot on start)).	When D3 goes to try the robot on the mat the others also stand up in encouragement.
D1	((Moves obstacle back)).	D1 and D2 work together at the mat.
D2	Make sure that it's flat.	

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Example videos and transcripts

Example of getting everyone involved

Here is one example of getting everyone involved taken from our research observations. You may see this demonstrated in other ways.

Watch the video, here: [Clip E – Getting everyone involved](#)

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this clip they are working together, all are contributing and they are frequently talking over each other making contributions. At the start of the clip they are all at the computer but E3 moves down to the mat to trial the robot and soon the other two join him. In general they move together as a group between computer and mat. E3 tends to be the one controlling the robot with either E1 or E2 controlling the computer. But there is a feeling that they are all sharing the challenge and working collaboratively as they move freely around the space. They all make suggestions and they build on each other's ideas.

Transcript

Speaker	Speech	Commentary
E2	That should turn the corner. But I don't know how far it's going to go.	
E1	And then stop.	E1 builds on E2's comment.
E2	Oh yes and then stop. Good point.	E2 echoes and praises E1's comment.
E2	Um I'm not sure how fast it's going to go so get ready to catch it if it goes too far.	
E3	OK I don't think it's going to go that far.	

Speaker cont.	Speech cont.	Commentary cont.
E1	I may need to halt the balancing thing.	E1 phrases her idea as a suggestion.
E2	Oh the programme.	
E1	Do you want to start it from here?	E1 phrases her idea as a question.
E2	Um yes we could just.	They all move over to the mat to trial the robot.
E1	Or we could start it from…	
E3	Start it from closer up.	They are overlapping – E3 finishes E1's sentence.
E2	Start it half way.	All three are making suggestions.
E1	No no no no no because it's going to do the whole thing… and again.	E1 gives a reason for disagreeing.
E2	Yeah it will... that's fine. It's still registering, it'll still register. Alright... No watch out! Watch out it might run into you. Right…	E2 uses a bit of humour here when she says 'it might run into you'.
E1	Whoa.	
E2	It needs to turn more.	
E3	Oh It needs to go forward.	E3 and builds on E2's point.
E1	It needs to go forwards.	E1 echoes E3 .
E3	It needs to go forward about 2 rotations.	E3 builds on the point.
E2	Two?	
E3	Maybe one or two.	
E1	Yeah because it didn't move on one.	E1 gives a reason.
E2	I don't think you can do a half.	E1 and E2 are at the computer while E3 is working on the robot at the table.
E3	You can do half a rotation.	E3 disagrees.

Speaker cont.	Speech cont.	Commentary cont.
E2	I'll just put another move ….. Come on…..there we go. If I just put another move here, half rotations - 1 – 35.	E2 carries on with her idea but she is talking in a tentative questioning tone.
E3	Yes.	
E2	35, is that right?	
E1	Yeah.	
E3	Yes.	
E2	That should work. What's this doing? There!	Talking to herself as she is working on the computer.
E3	OK.	
E2	Is it plugged in?	
E3	Yep.	
E2	Download.	E3 takes the robot for the next trial.

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Example videos and transcripts

Example of proposing ideas with inclusive language

Here is one example of proposing ideas using inclusive language in group work taken from our research observations. You may see these skills demonstrated in other ways.

Watch the video, here: Clip F – Proposing ideas with inclusive language

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this extract the boys are trying to solve a problem with their robot. The robot they have built is getting caught on an obstacle as it goes over it. All three students propose solutions to the problem. It's notable though that two of the boys do so fairly tentatively, using politeness strategies to soften the impact of their suggestions, whereas one student (F3) is quite decisive and pushes his solution forward. It might have been that the effect of this would be to prevent the others making suggestions, but at the end of this extract I2 has made an amendment to the programme and is suggesting that they trial its solution. So even though one student is quite dominant, the other students in this group are able to persevere to explore alternative solutions, to some degree at least.

Although the boys seem to be working quite independently at times they all still use the pronoun 'we' frequently and they do all talk about it as they are doing it – and explain their reasoning. In keeping talking they are making sure that they are all informed about what they are doing and therefore they are all able to challenge and make suggestions.

Transcript

Student	Speech	Commentary
F3	Perhaps a larger wheel on the back end would raise it up slightly?	F3 is making an indirect suggestion; 'perhaps' softens it further.

Student cont.	Speech cont.	Commentary cont.
F2	We don't actually have to do that though. The challenge just says you have to knock down the thing without running the guy over.	F2 disagrees and gives a reason why the group don't need to take that action.
F3	But where is the specification to …	
F1	Oh, no no no, I know why … it's because it's got this little bit on the bottom here.	F1 identifies a problem and shares the understanding with the group.
F3	Yeah, that's what I said why we need a larger wheel.	F3 suggests a course of action to solve the problem.
F1	Do we actually need that thing on the bottom is what I'm saying.	F1 clarifies - he is indirectly suggesting an alternative course of action through phrasing it as a question.
F3	Yeah, it makes its structure otherwise it would be wobbling about.	Gives a reason why F1's proposed solution wouldn't work.
F1	Get a larger wheel on the back then.	Now agrees with F3's suggestion.
F3	[inaudible]	
F1	Cos we just have to save him don't we?	Clarifying the requirements of the task.
F3	Yeah it has to completely cross.	
F1	Completely cross.	
F3	Yeah. Just read it.	
F3	What are those bits? Because those are not essential!	Seems to now understand what F3 was suggesting and seems to be agreeing.
F2	Hold on, hold on.	
F1	Are you saying we don't actually need those bits?	Asks for clarification.
F3	I thought you meant the bar at the bottom.	Explains misunderstanding.

Student cont.	Speech cont.	Commentary cont.
F1	Well yeah we can put the bar back on after.	Develops idea.
F3	Yeah…yes... but we have to keep the robot the same for every… Yeah never mind. Yeah that bar is essential we need a larger wheel… Now the question is where are the wheels?	Makes a decision that the solution is to replace the wheel.
F1	[Name]	
F2	Hold on…	
F1	It's fine we're just focusing on that we just need to see…	
F3	No just wait a second…	
F2	Or, you technically could just tell it to be more powerful, maybe.	Makes a suggestion for an alternative solution. Softens his suggestion through words like 'technically' and 'maybe'
F3	No it gets caught completely and utterly so we need to either get a larger wheel or alter the structure of the wheel arch.	Disagrees with F2's suggestion and gives a reason.
F2	Nah, shall we just download it and try because I've made a bit of an alteration to the power just to see what max power will do.	Disagrees with F3 and has taken steps to his suggested solution; suggests trialling it.

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Collaborative group work

Example videos and transcripts

Example of building on the ideas of others

Here is one example of building on the ideas of others as seen in our research observations. You may see this demonstrated in other ways.

Watch the video, here: Clip G – Building on the ideas of others

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this extract the girls are trying to diagnose what is going wrong with the robot as it doesn't do what they expect it to. They respond to the situation with good humour but also all remain focused on the problem and collaboratively try to work out what the problem is and what they need to do.

A lot of the group's communication is also unspoken. For example, at the end all three move back to the computer. They have implicitly agreed that some reprogramming is needed and that they will all move back there to contribute.

As they try to work out what is wrong all three girls narrate what is happening, particularly in the final sequence of turns where they build on each other's comments, collaboratively going step-by-step through what the robot is doing and what it should be doing. The cumulative 'thinking out loud' that they seem to be doing here appears to have a positive effect.

Transcript

Speaker	Speech	Commentary
	(G1 and G3 are adjusting the robot; G2 is fiddling with the other models).	All three are physically engaged.
G3	Wait, is it trying to find the black line?	G3 asks a question – she is implicitly suggesting what is wrong with the robot.
G3	Just stop it.	G3 uses a directive – communicating urgency.

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Speaker cont.	Speech cont.	Commentary cont.
G1	*((Starts robot moving forward - about to crash, readjusts it, it stops at black line)).*	
G3	Wait.	G3 uses a directive.
G1	It should do something else.	G1 is trying to work out what the robot is doing.
G2	Yeah, it's running.	G2 builds on G1; she is narrating what is happening.
G1	Oh, I don't-, we didn't put a-	
G2	*((Presses something on robot, robot moves forward, crashes into model)).*	
G1	Oh, oh, oh.	
G2	Oh right *((chuckles)).*	All three girls respond to the situation with humour .
G1	*((Smiles))* Unless it-	
G3	No, it's, it's stopped.	G3 is narrating what is happening .
G1	*((Robot moves forward, then speaks))* It's trying to find it. *((Turns robot - moves forward, then stops)).*	G1 is building on G1 – she is narrating and trying to explain what is happening.
G2	Oh no, when it finds it, it goes forward, so it shouldn't do that *((chuckles)) ((sits back at computer)).*	G2 builds on what G3 and G1 have said – she seems to come to a conclusion about what is going wrong; she moves to the computer to do something about it.
G1	It should stop when it finds it.	G1 builds on what G2 has said and clarifies her point.
G3	Yeah, but we want it to follow it.	G3 builds on what the others have said .
G2	Yeah, when it finds it, it's there *((indicates straight line with hand)),* it's not following it, it's just going forward. So *((chuckles))-*	G2 builds on the previous points and implicitly seems to conclude what the necessary course of action is.

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Collaborative group work

Example videos and transcripts

Example of asking the right questions; humour

Here is one example of asking the right questions and humour seen in our research observations. You may see these skills demonstrated in other ways.

Watch the video, here: Clip H – Asking the right questions; humour

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this extract the girls deal with an apparent setback when their robot doesn't do what they expect it to. It's notable that they all laugh at what has happened but also striking that even when reacting with humour they are still focused on a solution. It's also interesting to observe the degree to which the girls physically interact with the robot – they pick it up to demonstrate what they are saying and to make their meaning clearer to each other.

The different kinds of speech used by the girls appear to lead directly to collaborative problem solving. H3 narrates what the robot was doing wrong ('…then it came all the way back again'), which seems to lead to H1 asking whether it should come back. This in turn seems to lead to H1 asking whether it should come back. This then seems to lead to H3 suggesting a different course of action. Describing what is happening out loud seems to keep everyone focused on the problem and asking questions prompts them to consider a solution. Although the girls use politeness features in their speech such as inclusive language (eg 'we' and 'let's') and questions, they are also direct with each other and take action without consultation. H2 moves to the computer to act on H3's suggestion without any discussion – as if they have an implicit understanding of their roles – and she also uses the blunt command 'plug it' to prompt quick action.

Transcript

Speaker	Speech	Commentary
H2	*(Sets robot moving forward - moves forward, says 'control', starts following black line)* It [*unclear*].	
H1	Let's bring it back and- Oh *(surprised)*.	H1 starts to suggest an action.

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Speaker cont.	Speech cont.	Commentary cont.
H2	Oh, OK *(robot moves backwards) (chuckles)*.	The group is responding to their apparent setback with humour .
H3	[*unclear*] some milk.	
H1, H2	*(Chuckles).*	Humour.
H3	You see, that was fine because it pushed it in *(pointing at robot and model)*, but then-	H3 is narrating what happened.
H2	Then it came-	H2 starts to build on what H3 was saying.
H3	then it came all the way back again.	H3 is narrating what happened – this seems to prompt the questions asked by H3.
H1	Does it need to come back? Should it come back like that *(pointing to robot)*?	H1 asks questions to prompt reasoning – this apparently leads to the proposal that H3 goes on to make.
H2	Yeah, it's following the black line *(chuckles)*.	Humour.
H1	But it's not the right one *(chuckles).*	Humour.
H3	Why don't we-	
H1	I think-	
H3	Wait, if it's like this or whatever *(indicating to robot and model)* and that's out, and it's here *(moves robot)*, and it's pushed that in, can't we just say, oh, just find a black line then? Why do we need to have it turn back?	'Wait' has the effect of refocusing the group after the laughter. H3 is reasoning and proposing a solution; in phrasing it as a question she prompts collaborative thinking and action.
H1	Yeah.	Agrees.
H2	*(Moves to computer).*	Reacting to H3's suggestion H2 takes the initiative and moves to the computer to start the reprogramming .
H1	We don't need it to go back 'cos [00:20:38] *(moves robot)*.	H1 continues the reasoning, building on H1 – confirms her suggestion.
H3	But then it's going to turn anyway to find the black line.	H3 continues to build on her suggestion.
H2	OK, plug it *(holds up cable)*.	H2 directs the action with an imperative.

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Collaborative group work

Example videos and transcripts

Example of inviting, building on and challenging the ideas of others

Here is one example of inviting, building on and challenging the ideas of others, seen in our research observations. You may see these skills demonstrated in other ways.

Watch the video, here: Clip I – Inviting, building on and challenging the ideas of others

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

This group remains focused on the task throughout and the girls work together with humour. Throughout this extract there is evidently a shared focus – the three girls move together from the table to the computer and back again and their gaze is often on the same point or they are making eye contact with each other when speaking. They share the tasks out without explicitly discussing who is doing what and although during this section one student is doing the programming all three focus on it and contribute. The three don't always agree on the course of action but they deal with disagreements with good humour and give reasons for their decisions. The three girls exchange knowledge effectively – they explain what they are doing and sometimes explain why. All three suggest steps to take to solve the problem and I1 and I2 build on each other's points. I3 challenges the other two, prompting them to consider different courses of action, but is accepting of the solution chosen when the reason for it is explained.

Transcript

Speaker	Speech	Commentary
I2	Ooh, ooh, ooh *((excitedly))*. It's working *((excitedly))*. No, it needs to turn back more because it finds the black line there but it needs to find the black line there *((pointing to table))*, so then [unclear] get stuck.	I2 analyses the problem with the robot. She suggests a course of action 'it needs to turn back more' and supports it with reasoning 'because it finds the black line there but it needs to…'.
I1	So .5 backwards.	I1 builds on the suggestion of I2, clarifying how far the robot needs to turn back.

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Speaker cont.	Speech cont.	Commentary cont.
I2	Yeah *((moves to computer))*.	I2 agrees and moves towards the computer to make the change. The group don't discuss this – she assumes responsibility for doing it.
I3	Wait, it's going -, how much is it going backwards now?	I3 intervenes, and asks a question for clarification. She tries to make sure that the proposed solution is the correct one.
I2	0.5 *((clicking on mouse))*. It needs to go back 0.8.	I2 responds and builds. The girls are effectively exchanging knowledge.
I3	Why 0.-	I3 sounds exasperated with the decision, and asks why they are doing it that way. The other two girls respond to her with humour.
I1, I2	*((Chuckles))*.	
I3	Just have it going back 1 *((moves to computer with X))*.	I3 develops her point.
I1	[unclear].	
I2	That's fine. Right, does it work after that *((looking at table))*?	Tries to focus on next step of the task. Invites comment from the others.
I1	[00:26:56]. But then, erm *((looking at screen))* rotate the, erm-	I1 keeps the focus on this step.
I3	Well, we need to time how long it will take for it to go.	I3 proposes an alternative course of action.
I1	Yeah.	Agrees.
I2	Yeah, so it's 5.	Clarifies.
I3	So what speed's it going round?	I3 asks for information – again she uses questions to make sure the solution they are choosing is the best one.
I2	As fast as it wants. Right, so this isn't unlimited. It's going to be five rotations *((clicking on mouse))*.	I2 jokes 'as fast as it wants', but immediately focuses back on the task, signalled by the word 'right'. She is describing what she is doing.

Speaker cont.	Speech cont.	Commentary cont.
I3	No, do seconds, do seconds.	I3 disagrees and suggests a different way of doing it.
I2	No, I've counted rotations as 5.	I2 disagrees with I3 and explains that she's worked out the correct number of rotations.
I3	OK.	Accepts the explanation.
Teacher	This might have to be the last run for today, I think.	
I1, I2, I3	*((I1 unplugs robot, all move to table))*.	

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Collaborative group work

Example videos and transcripts

Example of building on ideas and echoing the language of others

Here is one example of building on ideas and echoing the language of others seen in our research observations. You may see these skills and traits demonstrated in other ways.

Watch the video, here: Clip J – Building on ideas and echoing the language of others

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this extract, which is taken from close to the beginning of this session, all three participants are engaged in solving the problem and all three propose possible courses of action. J1 takes quite a leading role throughout. In her first utterance she establishes what the first step is in the problem solving process. She is quite assertive but softens the potential impact of this through her use of inclusive language ('first we…') and her use of questions ('Do you want to measure it or do you want to do rotations?'). This use of a question also makes sure that the other two are participating in the problem solving process. Both respond to her with suggestions about how to get the robot to the line.
All three also seem comfortable with challenging each other's suggestions. They use inclusive language, humour and hedges (such as 'maybe' and 'like') to soften the impact of these challenges.
It is also important to note where the three girls are looking during this extract. For much of the time, when they are speaking to each other, each of them turns to look at the others. For example, when J3 challenges J2 to develop what she has said ('Seconds? Rotations?) she looks directly at her. At other times they maintain a shared focus on whatever they are talking about, such as what is on the computer screen. All three turn to look at the table when J1 gestures when she says 'that'.

Transcript

Speaker	Speech	Commentary
J1	*(All sit down at computer)* First we need to get it from the sort of like, segment.	By starting with the word 'first' J1 shows an implicit awareness of the need to take a step-by-step approach to the task. She uses inclusive language when speaking about the group as 'we'. She is proposing an action but softens it with 'sort of like'.
J2	[*unclear*].	

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Speaker cont.	Speech cont.	Commentary cont.
J1	Yeah, but we need to get it to the black line. Do you want to measure it or do you want to do rotations?	J1 seems to build on what J2 says here (although it is difficult to hear J2). She then suggests a couple of different approaches. By phrasing this as a question she is making sure the other two are engaged and involved in the decision-making process.
J3	Move it forwards unlimited. Do it forward unlimited.	J3 suggests a course of action. The way that she uses some context-specific language here ('unlimited') without explaining it indicates that the group have a pre-established shared frame of reference.
J1	Oh yeah.	Agreement/feedback. This shows the others that she's engaged and listening.
J2	I'd say five, maybe six.	J2 responds to J1's question. She assumes the others will understand what she is referring to, but as is evident from J3's response, she isn't clear.
J1	No, shall we just do -	J1 disagrees with J2 and again phrases a proposed course of action as a question. This utterance finishes below. She uses inclusive language – 'shall we'.
J3	Seconds? Rotations *(to Y)*? Minutes? Hours?	J3 asks J2 for clarification. She softens the impact of this through humour, exaggerating - 'Minutes? Hours?'.
J2	No, 'cos we [*unclear*].	J2 disagrees.
J1	Unlimited?	J1 is agreeing with J3's proposal.
J3	Yeah, unlimited, 'cos then-	J3 reiterates her suggestion and nods in agreement.
J1	But, if we do it unlimited until it gets to that *(looking over at table)*-	J1 builds on J3's suggestion. She gestures at the table when she says 'that' to make sure everyone knows what she's referring to.
J3	Until it gets to the black line *(looking over at table)*.	J3 echoes what J1 is saying to show engagement and agreement.
J1	Black line, and then maybe do, like, one rotation.	J1 builds on the suggestion to 'do it unlimited' and suggests the next step. She softens the force of her suggestion through 'maybe' and 'like'.
J2	Half a rotation.	J2 builds on the previous points and suggests half a rotation.

Collaborative group work

Example videos and transcripts

Example of asking clarifying questions to guide action

Here is one example of asking clarifying questions to guide action demonstrable in group work as seen in our research observations. You may see these skills and traits demonstrated in other ways.

Watch the video, here: Clip K – Asking clarifying questions to guide action

The level of detail here is designed to help you to see the kinds of things we have been identifying in our research. We wouldn't expect you to make these sorts of notes, they are just to guide and inform the watching of the video extracts.

Commentary

In this extract the girls are dealing with a proposal for a different approach to solving the problem that K2 makes. Questions are used for different purposes here. K2 phrases her suggestion as a question "have you ever thought…?" instead of just bluntly suggesting it. In using the question form instead of a different approach, she softens the effect of what is a direct challenge to the approach they had been taking previously. A question is also used to gain clarity when K1 asks her "what do you mean?" This question illustrates a critical engagement with what K2 has proposed – a less successful group might dismiss it or just accept the suggestion but K1 makes sure the group understands what is being proposed before they act.

The use of praise is also notable here. Both K1 and K3 praise K2's suggestion. Up to this point K2 has been quite quiet so this perhaps reflects some implicit recognition from the other two that H2 needs encouragement.

Another notable feature of this extract is the way the group trial this alternative approach and think through its implications. K1 in particular verbalises her thoughts about what it might mean. In speaking her reasoning out loud she makes sure the other two are involved and invites collaborative thinking, which K3 responds to when she says, "yeah, it will still turn on the line though".

Individuals in the group also make clear decisions and instruct the others where appropriate. K1 instructs K3, who is sitting at the keyboard, to "make it go forward" and K2 decides that one rotation is sufficient.

Transcript
(overleaf)

Speaker	Speech	Commentary

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Speaker	Speech	Commentary
K2	Have you ever thought of like doing it from a different angle, from more towards there *(pointing to table)* and just doing it that way?	K2 suggests a new course of action. She softens it by phrasing it as a question - 'Have you ever thought…?' and with the hedge 'like'.
K1	What do you mean?	K1 asks K2 to develop her point further.
K2	*(Stands up and moves to table)* So, like, instead of doing it from this way do it from this way.	K2 explains and physically moves to illustrate what it is she means. The use of the hedge 'like' again softens the impact of the suggestion.
K1	That is a clever idea that we hadn't thought of.	K1 praises K2.
K3	*(Looking over at table))* Oh yeah, that's a good idea.	K3 agrees and praises K2.
K1	*(Unplugs robot, takes to table).*	
K2	[16:47] try it and-	
K1	Do you want to try it so I can tie my shoelaces?	Off task talk but it doesn't stall the activity – they are still focused on the task.
K2	No, you can try it. Live on the edge.	K2 uses humour to deflect the suggestion that she should do it.
K1	*((Takes robot to table))* But then we've asked it to turn.	K1 is verbally thinking through the possible implications of the change in approach.
K3	Yeah, it will still turn on the line though.	K3 builds on K1's point.
K1	*((Places robot on start, sets it moving forward - moves forward, stops, beeps, moves forward, stops on black line)).* Actually, no, that's right, because now it goes forward *((pointing to model))* and it can turn. So make it go forward.	K1 is testing the robot and again reasoning out loud the effects of the change in approach. At the end she makes a clear decision about the next step and instructs K3, who is at the keyboard, to make the change.
K3	How many?	K3 implicitly accepts the suggestion and asks for more information.
K1	Erm-	
Speaker cont.	**Speech cont.**	**Commentary cont.**

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K2	That's a one.	K2 makes a decision.
K1	Yeah, one rotation…	K1 agrees.

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