“We can make our words powerful”: Students’ perspectives about using Talk Factory, a classroom technology to support exploratory talk

Lucinda Kerawalla*, Meera Chudasama, and David J. Messer

*Lucinda Kerawalla is an honorary lecturer (she was a full-time senior lecturer when she undertook the research reported here)
Children’s Research Centre, Faculty of Wellbeing, Education and Language Studies, Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.
Country of residence: UK
Email: cindy.kerawalla@open.ac.uk
Phone: 07375 942902
Fax: none

Meera Chudasama is an English, Media and Film Studies teacher at a secondary school in the UK. She is also a visiting researcher at Children’s Research Centre, Faculty of Wellbeing, Education and Language Studies, Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.
Country of residence: UK

David Messer is Professor (emeritus) at Children’s Research Centre, Faculty of Wellbeing, Education and Language Studies, Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.
Country of residence: UK

Acknowledgements
We are grateful to all the students who participated in this research.

No external funding was received.
Abstract

Previous research suggests that students can use exploratory talk to support their thinking and learning. However, students’ own perspectives on such talk, and whether/how they value it, are rarely sought. Thirty 12-year-olds and their teacher used Talk Factory on an interactive whiteboard and iPads to support exploratory talk in English lessons twice/week for five weeks. Four focal students took photographs and chose words that described their feelings; their responses were discussed in two interviews together with their experiences of the lessons. These students were video recorded whilst presenting their experiences and opinions to the class. Thematic analysis of the interviews identified four themes: how students adopted exploratory talk, challenges they faced, ownership of their discussions, and the value of mobilising their ideas. The students described feeling more empowered, more engaged, and how they valued the exploration of difference.

Key words: Talk Factory, exploratory talk, secondary school.

Introduction

Bleiman (2020) asserts that “dialogic learning and the opportunity to talk to your peers in constructive ways are at the heart of English as a subject” (p. 94). The importance of dialogue is recognised by Yandell and Brady (2016), who describe the English classroom as being “a site of development and contestation” (p. 54); it is where students can critically explore the ideas in texts (e.g., Wilson & Laman 2007), develop new understandings through inter-thinking (Littleton & Mercer 2013), and participate in “hypothesising, exploration, debate and synthesis” (Barnes 2010; p. 7). These authors agree that talk, more specifically talk between students, plays an important role in English classrooms. Barnes (e.g. 2008) identified “exploratory talk” as being of particular value for meaning making because “it enables the speaker to try out ideas, to hear how they sound, to see what others make of them, to arrange information and ideas into different patterns” (p.4). However, students usually need to be taught about exploratory talk; what it is, its importance, and how to implement it. Mercer et al. (2013) developed a set of ground rules to help students use exploratory talk:

- engage critically but constructively with others’ ideas;
- offer all relevant information;
- treat all ideas as worthy of consideration;
- ask questions and answer them;
- ask for reasons and give them;
- try to reach agreements before progressing.

Research suggests that these ground rules can be effective in mediating learners’ joint meaning-making (e.g. Rojas-Drummond et al. 2003). Wegerif (2007) describes the process of meaning making as the construction of difference in dialogic space when students bring into play different perspectives of equal value. In this space of “uncertainty, multiplicity and potential” (Wegerif 2010; p. 312) lie differences to be explored. He suggests the construction and exploration of difference enables students to develop intellectual freedom, “a capacity to question and to be able to think for themselves” (Wegerif 2010 p. 340); processes which are fundamental to education. Several researchers (e.g. Mercer et al. 2004; Littleton & Mercer...
2013; Kerawalla et al. 2013; Kerawalla 2015) have illustrated how exploratory talk can facilitate the creation and exploration of difference in classrooms.

Classroom discussions can also facilitate the development of written work and help prepare for formal assessments of talking and listening skills (e.g., Assessment and Qualifications Alliance 2015). The National Curriculum in England (DfE 2013) for Key Stage 3 English (ages 11-12 years) recognises that:

Pupils should be taught to understand and use the conventions for discussion and debate, as well as … working collaboratively with their peers to discuss reading, writing and speech across the curriculum (p.2).

Many current adult discussions about important topics involve polarization and hostility to different opinions. If we value a bridging of divisions and/or respect for difference, then support for exploratory talk offers a significant way for our educational systems to address these issues. Talk Factory (TF) is a web-based tool that can be used to support exploratory talk and is described next.

Talk Factory

Here we explain the development of TF, review research which has evaluated its use, describe the version of TF used in the current study, and note how TF has been developed further.

TF was conceived by the first author and developed with colleagues in consultation with teachers and students for a one-year ESRC funded research project. TF is available online at no cost. TF takes advantage of classroom interactive whiteboards (IWB) to display the ground rules of exploratory talk and, most importantly, for providing an evolving graphical representation of how well a class adheres to these rules in real time, during whole class discussions. In previous studies, learners have memorised the ground rules of exploratory talk or referred to written posters (e.g., Mercer et al. 2004), and there was no method for teachers and students to record how well a class was applying these rules, or of tracking progress over time. There has been evaluation of various alternative technologies to support classroom dialogue (e.g., Wegerif 2017; Major & Warwick 2019), however, these do not visually represent the ground rules or any improvements in the discussion.

The first study of TF evaluated its use in primary science (Kerawalla et al., 2013). Subsequently, TF continued to be used by some schools and its use has been evaluated in a range of subjects in a secondary school (Kerawalla, 2015). In response to teacher and student requests during the aforementioned research, TF has been developed further in the following ways:

- Graph Factory (GF) is a feature which enables the teacher to display and/or print previously saved bar charts side-by-side on a single screen (Figure 2), thus facilitating comparisons.
- Ground rules can be edited by the teacher/students to support their evolving needs.

The version of TF used in the current study, and how to use it, are shown in Figure 1.
Further description, with photographic illustrations, is given in the Results section. Since the study was conducted TF has been further developed as a Progressive Web App (PWA) and this remains free to users.\footnote{At the time of writing, Talk Factory is available at http://talkfactory.uk. The Talk Factory apps used in the current study are no longer available, however the new PWA will be available shortly at https://talkfactory.uk and will be suitable for use on desktop and handheld devices.}

In TF there are three positive (orange) rules for talking (A in Figure 1) and three (blue) behaviours to be discouraged (B). The rules can be displayed under the bar chart (as in Figure 1) (this is ideal for young children who may not be able to reach higher up the IWB) or down one side to avoid the need for the person tapping on the rules to walk in front of the IWB (C). During discussions, the teacher/student codes what is said by clicking (laptop) or tapping (whiteboard/iPad) on one of the rules. As a result, the bar chart (D) and the timeline (E) evolve in real time during the discussion. The sum for each rule is provided above each bar and the sum of positive rules (F) and negative behaviours (G) appear next to an emoticon. The rules can be edited to match learning needs (H). At the end of a discussion, the bar chart can be saved and later reloaded (I).

Figure 1: Information about Talk Factory

We acknowledge that exploratory talk can be taught in classrooms without TF (e.g., Littleton & Mercer 2013). However, previous research (Kerawalla et al. 2013; Kerawalla 2015) suggests that TF can provide a display which can help students and teachers to:

- see the rules of exploratory talk and relevant prompts to help them structure their talk;
- see how each contribution to the discussion makes a positive (or negative) contribution, in real time. This makes students accountable to the rest of the class and can help create a sense of community, trust, and respect;
- see the evolving “shape” of the discussion displayed by the changing bar chart and the number of positive and negative contributions, and act on this feedback. This encourages reflection and metacognitive awareness;
- develop listening skills by evaluating others’ contributions.

There have been only a few negative comments about TF. Most are suggestions about making the interface more flexible, which have been implemented. Some teachers report they find it challenging to adjust their lesson plans to incorporate exploratory talk, while another said that her students initially found the pedagogic shift difficult (e.g., Kerawalla 2015). However, these challenges would apply even if TF were not being used.
Research Question

Most previous research into classroom dialogue has focused on enhancing adults’ understandings of the value of exploratory talk by analysing the content of students’ classroom discussions (e.g., Littleton and Mercer 2013; Kerawalla et al. 2013; Kerawalla 2015; Alexander 2018). Similarly, Reznitskaya (2012) has developed a framework for teachers to evaluate their own dialogic teaching. Books on classroom talk may include lesson plans and resources for teachers (e.g., Dawes & Sams 2017; Reznitskaya & Wilkinson 2017), and Alexander (2020) offers guidance for dialogic teaching. Research questions that focus on students’ perspectives, and data collection methods that focus on eliciting the voices of students, have been a peripheral concern. There is little known about, for example, what it is like for school students to learn how to talk in new ways, and whether/how they think exploratory talk has any educational value. Exceptions include brief mentions of how TF can increase students’ confidence in contributing to discussions, or how its use can improve student’s understanding of the value of listening to others’ ideas (e.g., Kerawalla 2015; Kerawalla et al. 2013).

The current study begins to address this gap by exploring 11-year-old students’ perspectives about using TF and GF, on a whiteboard and on iPads, during English lessons in a secondary (high) school. Our research question was: what are students’ perspectives on using TF and GF with a whiteboard and iPads to mediate exploratory talk during whole class and group discussions in an English classroom?

Methodology

We adopted a socio-cultural psychological perspective (e.g., Vygotsky 1978) which facilitated our exploration of the subjective experiences of students when they used TF to mediate their exploratory talk.

Participants

The research took place in an English suburban secondary (high) school which serves a multi-ethnic, predominantly middle-class area. The school supports teacher researchers: the second author teaches at the school and is School Research Lead. The study took place in her Year 7 English class of 30 students aged 11-12 years.

The investigation was given a favourable opinion by the relevant Ethics Panel at the first author’s university. Full informed consent was sought from every student and their parents/guardians. They were advised that the teacher would use TF in English lessons for five weeks and were asked whether they agreed to participation in research about the students’ experiences. Students and parents were assured that there would be no adverse consequences if they declined, and all the class would take part in the lessons. Also, they could withdraw from the research at any time without giving a reason. Three students declined to participate and provided no data.

In order to give students an opportunity to describe their experiences in depth in a necessarily limited time, a focal group of four students was drawn from the 15 who had given full consent to participate in all the research (some other students requested that their face be pixelated in reports). Two females and two males were selected by the teacher to represent various “ability” levels and the ethnic diversity of the class. We focus on the data from the
four focal students. The rest of the class were involved in all aspects of the lessons and contributed to all class discussions.

English lessons: Voices of our Generation

The students attended nine 60-minute English lessons over a five-week unit called “Voices of our Generation”. They considered the viewpoints of public figures (e.g., an actor) on topical issues (e.g., social media), discussed their own perspectives and then wrote about these issues. The teacher thought this was an ideal opportunity to use TF to support exploratory talk during whole class and group discussions. The early lessons concerned the value of thinking, talking, and exploring together, and involved learning about TF. As confidence with TF increased, its operation was gradually transferred from teacher to students and culminated with their using TF on the whiteboard by themselves during whole class discussions in lessons 4-6, and then using the TF app on iPads unaided during group work in lessons 7 and 8. The focal group discussed their TF experiences with the rest of the class in lesson 9.

The teacher and the first author designed the lesson plans to address curricular requirements and provide opportunities for discussions (class and group) involving TF. The teacher took responsibility for the conduct of the lessons and the first author focused on data collection.

Data collection

To give a rich picture of the students’ TF experiences, an exploratory multi-methods approach was adopted (e.g., Stebbins 2001). The four focal students participated together in the activities described below. These involved visual, oral, and written representations of their experiences that were discussed with the first author in two 50-minute interviews that followed lessons four and eight. Each audio-recorded interview took place in the empty school canteen and was later transcribed.

Interviews

Previous research has illustrated the effectiveness of semi-structured, participant-generated, photo-elicitation interviews for gaining insights into the perspectives of young people (e.g., Raby et al. 2018). Given the visual nature of the TF displays, it was thought that photographs by students would be a good way to capture their experiences. Each focal student was loaned a digital camera and was advised to “take photos of anything that you think shows your experiences of TF during your English lessons”. These students sat in the front to give an unrestricted view of the whiteboard, minimise disturbance, and ensure students without photo consent (who were identified to the focal students) were excluded.

In the first half of both interviews each student selected two photographs that captured their perspective about TF. These were discussed with the first author and the group. The photographs were described verbally to facilitate identification in the transcripts.

Feelings

Previous research suggests that asking students to select words that describe their feelings during learning activities, and then, in a follow-up interview, asking them to reflect upon their word choices, can elicit rich descriptions (e.g., Kerawalla & Messer 2018; 2019). In the first interview (second half) the students were given a list of words commonly used to
describe feelings and each was asked to select three that applied to them during TF lessons. They were free to generate their own words if they chose. Their choice of words was then discussed.

Semi-structured interview about TF

In the second interview (second half), the students were asked about their overall TF experiences, including their reflections on using TF during class discussions and using the TF app on an iPad during group work.

PowerPoint presentation

The focal students decided to give a PowerPoint presentation about TF to the whole class in lesson 9. This was video recorded and later transcribed.

Data analysis

The transcripts associated with three of the activities were analysed (photographs, feelings, and TF in general). To aid coding, the students’ photos were copied into the relevant transcripts. Each transcript was analysed separately to provide triangulation across the three approaches. The transcript about feelings was randomly selected to be analysed first by thematic analysis (Braun and Clarke 2006) using NVivo. First, speech was coded in terms of the experience it described. Next, the codes were categorised into themes. Following this, transcripts about photographs and then about TF in general were analysed in the same way. This generated three sets of themes and exemplar quotes. The next stage involved the identification of differences and similarities in the themes across the transcript types. This was done in a table using Word which facilitated moving and re-labelling themes and quotes, and the identification of sub-themes across and within each source of data. The resulting themes and subthemes (see Table 1) were discussed amongst the three authors until agreement was reached.

Findings

Students’ presentation

In keeping with our focus on student perspectives, we have not analysed the students’ presentation from our adult academic perspective; instead, we provide a brief summary which can be checked against the transcript and the relevant PowerPoint slides (see supplementary material). The presentation provides a useful overview of student perspectives before considering the four themes that arose from our analyses.

In the presentation, three focal students (one was absent) reported initial feelings of uncertainty about TF which were reflected in the questions on their first slide: e.g., “what do I press?” and “how will this improve my English?”. After using TF they reported increasing confidence. They also reported TF changed the way they discussed issues, and that lessons were more interesting because there were debates rather than arguments. TF also helped create a “safe environment” where opinions were respected, and students thought before they spoke. The focal students liked having a discussion circle and talking to each other, rather than at the teacher. These students said that by the end, the class knew how to use TF and the debates were more “in-depth”, engaging and thoughtful. The presentation appeared to
provide a valid perspective for the whole class, as there was little disagreement from the rest of the class about what had been said.

Thematic Analysis

Analysis of the three transcripts gave rise to four themes and fourteen subthemes (Table 1).

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub themes</th>
<th>Data sources (X) of each theme and subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>How we adopt exploratory talk</td>
<td>Monitoring Progress Using TF/GF</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Making thoughtful and careful contributions</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Providing a rationale for our perspective</td>
<td>X</td>
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<tr>
<td>Challenges we faced</td>
<td>Remembering to use TF</td>
<td>X</td>
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<td></td>
<td>Unnatural discussions</td>
<td>X</td>
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<tr>
<td></td>
<td>Lack of flexibility in TF tool</td>
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<td></td>
<td>Feeling anxious</td>
<td>X</td>
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<tr>
<td>Our ownership of our</td>
<td>Taking control</td>
<td>X</td>
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<tr>
<td>discussions</td>
<td>Supporting and respecting each other</td>
<td>X</td>
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<td>Changing the TF rules to support our</td>
<td>X</td>
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<td></td>
<td>self-improvement</td>
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<tr>
<td>The value of mobilising our</td>
<td>Making our ideas powerful</td>
<td>X</td>
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<tr>
<td>ideas</td>
<td>Creating and celebrating difference</td>
<td>X</td>
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<td></td>
<td>Creating change, or not?</td>
<td>X</td>
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<td></td>
<td>Feeling personally happy and valued</td>
<td>X</td>
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*discussion about feelings **photo-elicitation ***discussion about TF in general

Table 1 Themes and sub-themes from the interviews.

The four themes are discussed below alongside representative quotes. Data sources are indicated in the text. Feelings words used to describe the students’ experiences are italicised to aid identification, and relevant student photos are included. The value of this approach is considered in the discussion section.

Theme 1: How we adopted exploratory talk

This theme describes new forms of classroom interactions and how progress was monitored. There are three subthemes.

Monitoring progress using TF and GF: One student described how “I look [at the bar charts] and I think ‘oooh I would have said that in a different way’. I look at TF throughout the lesson, after people say their opinions and views, and then I also look at it at the end to see how we’ve improved as a class”. A second said, “basically as we’re speaking we can track what we’re saying and how we can improve on our, like, opinions and stuff. TF helps keep us occupied [focused] on how well we are doing, which is good, and how bad we are doing also”. Another student took a photograph of a teacher-annotated GF whiteboard screen during
a whole-class discussion about what TF shows and talked about using it to evaluate progress (Figure 2).

Fig.2 A student’s photograph and commentary (details added in black text by the authors for clarity)

**Making thoughtful and careful contributions:** In all three data sources all four students agreed that discussions had become more “controlled” and “civilised”. They reported that previously “we’d just say the first thing that came into our head” which might “cause people not to be friends”. In contrast, TF lessons were “civilized because everyone can find a way of disagreeing with each other, everyone is very mature, and no one talks over each other”.

**Providing a rationale for our perspectives:** All four students talked about the importance of explaining their perspectives to construct a persuasive argument, e.g., “some people would say that they would want to take a book [to outer space] because it’s ‘good’. That’s boring. If you want to engage with an argument you have to give strong points that people can rebuttal (sic) back on, almost persuading someone to go with your point”. They all also recognized, as exemplified by this quote, that “if you disagree with someone and explain it then that means that you’re understanding each other”.

**Theme 2: Challenges we faced**

Our analysis identified four challenges (i.e., subthemes).

**Remembering to use TF:** All the students mentioned this challenge when clicking or tapping on the TF rules. One said, “when we’re really in depth in a conversation, or we’re drawing and we’re talking about our drawing, we kind of forget to tap on the iPad”, and another said that “when I was on the [teacher’s] computer [with TF whiteboard display] Miss had to say ‘click’ because I was so engrossed in the conversation”. However, they all agreed that tapping/clicking on the rules required careful listening and developed their own critical meta-awareness of the contributions made by their peers.
Unnatural discussions: A further challenge that they all discussed was that “sometimes when we [use TF] with the whole class it can be a bit choppy - you talk and then you stop, then the other person has a go, then they stop. When you’re in the smaller group you can kind of like have a conversation, it’s more of a flow”. This could be because of turn-taking during discussion involving 30 students. However, the students agreed that whole-class discussions with TF were an effective way to develop new ways of talking before applying them to other situations.

Lack of flexibility in TF tool: all the students agreed that more flexibility could be built into TF so they could have more positive and negative rules.

Feeling anxious: One student said that he felt “a bit nervous” during whole-class discussions “because you’re scared [what you say] might be offensive or it might be a bit embarrassing or a bit silly”. The others did not identify with this, but all agreed that they preferred to work in small groups, as described by a student who said that “that’s when you are more able to express what you actually think”.

Theme 3: Our ownership of our discussions

There are 4 subthemes.

Taking control: The students agreed they experienced a new sense of freedom during TF lessons because they were given more control. They described this in several ways. First, that they had more control over the ideas put forward, one student explained he felt “free because I can … say what I think in my own speech”. Second, they were free to talk to each other rather than just to the teacher: “I wrote free [on my questionnaire] …talking to each other is a lot nicer and you have more control over the discussion”. These points were summarised by a student who, when discussing one of her photographs, compared TF lessons to previous lessons (Figure 3).

Fig.3 A student’s photograph and commentary about taking control.
Supporting and respecting each other: A further subtheme was trust and the importance of mutual support. A student described this in terms of feeling “free when I say my ideas because I think of everyone in my class as my friend”. Another student said that:

It’s made us confident to speak…to trust the class that no matter what you say, they’re going to respect it whether they agree with it or not… and build their opinion off of it. I feel like it has brought us closer as a class and has made us get to know people more, especially as we only joined the school this year.

The increase in trust and classroom community led to one student feeling more “confident because at the start of the year I was a bit anxious to put my hand up...once TF came in I could see everyone who were also nervous were putting their hands up so I thought well, if they’re doing it so can I, so I did it.”

Changing the TF rules to support our self-improvement: During lesson 4, the teacher led a discussion about changing the TF rules and the class decided to delete three rules. The students usually explained their ideas and so felt two TF rules could be deleted (explain reasons and not giving reasons). As the current speaker routinely elected the next speaker, the ask others rule also was deleted. The students wanted to progress further by making new, more difficult rules to address their current shortcomings. One of the four focal students described how “sometimes, when we gave reasons why, we wouldn’t add anything new [to what had been said already]” which often made the discussions repetitive. Consequently, two new rules were added, a positive TF coding when a new idea was introduced and a negative coding if nothing new was added. Another new positive rule was to further explore the ideas of others.

A student reflected upon the effects of these edits on subsequent classroom dialogue, and on her development as an effective contributor:

Before we changed the rules, the bar along the top [of the TF screen] was mostly yellows (i.e., we were doing things mostly right). When we [as a class] changed the rules …we were picking up, almost, all that we were doing wrong, and putting it [in the new rules] as our weakness so we could improve on that weakness. I felt that … even though the bad ones were showing up a lot more than they were before, I felt that that was a good thing because we can deter[mine] what we did wrong and what I could do next time to make my, umm like, speech better.

Theme 4: The value of mobilising our ideas

This theme and the four subthemes illustrate students’ awareness of the power of their ideas and opinions to resource the construction of difference in dialogic space. It also describes the effects on their learning and feelings.

Making our ideas powerful: The students discussed how using TF helped them to realise that their ideas and opinions matter. One student compared TF experiences where students’ ideas were discussed with earlier “initiation, response, feedback” (IRF) (e.g., Edwards and Mercer
(1987) interchanges with the teacher where she felt that students’ ideas are sought but taken no further:

“Before [TF] ….. when we gave points [in response to a teacher-initiated question], we’d tell her it, and she’d say blah blah blah, and [what we say] would then get lost, it kind of just goes away because then she’d ask someone else something else. Some of our points could be explored a lot more”.

The other three students supported this by saying, for example, “before [TF] we were putting our points, but we weren’t expanding to our true potential” but “TF gave us a chance to expand our ideas”. All of the students appreciated being “listened to” because before, when we were talking to the teacher… I felt like only a few people were looking”.

The students discussed how TF had elevated the status of their classroom contributions. One said: “we can all talk and make our words powerful to one another”. A second student said that being listened to resulted in her feeling “powerful”. These comments point at students developing understandings of the power of their ideas for resourcing exploratory talk/learning, and how empowered they feel when their opinions are made to matter.

**Contributing to difference:** One student referred to her photograph of the teacher’s writing on the whiteboard. The writing summarised the ideas from a whole-class discussion with TF about ’thinking together’ (Figure 4).

”I took a picture …. because it was showcasing everyone’s opinion. Miss was writing it down as people spoke. I think it is important that our opinions are showcased so other people can look at the board and agree or disagree, or at least understand what we’re trying to say”.

**Fig.4** A student’s photograph and commentary about difference

Figure 4 captures various aspects of the dialogic space created by the class i.e. their arguments and counter-arguments. Writing down the students’ ideas, and “showcasing” them meant that their opinions were no longer “lost”. Instead, they were legitimised as valued contributions to the students’ construction of difference because, in the words of the same student a little later, “other people can battle back with their point and I can battle back with mine”. Difference was also discussed by another student when explaining his feelings. He
celebrated that TF discussions made him feel “unique because what you think during a class debate or conversation is sometimes different to what others think”.

Creating change, or not: This topic was important to all four focal students who reported how they had discussed their peers’ opinions and used them to resource their own change of mind. One student chose a photo of her exercise book to illustrate how she used TF to integrate other people’s ideas into her written work (Figure 5).

![Figure 5 A photograph of the student’s exercise book, and commentary](image)

“This photo is of my book and how I transferred my opinions into my book through Talk Factory. I could include other people’s opinions into my own opinion in some way”.

Another student shared photographs taken during a whole-class discussion about their history lessons and said TF could be implemented in these lessons to help the integration and ‘improvement’ of ideas (Figure 6).
Fig. 6 A student’s photographs and commentary about creating change

The possibly of changing someone’s mind was motivating for some students who said that this made them interested during TF discussions. However, another student recognised that listening to others’ opinions opened her mind but did not always result in a change (Figure 7).

Fig. 7 A drawing depicting the copyright content of a student’s photo and commentary

Feeling personally happy and valued: Whilst discussing their questionnaire responses, all four students mentioned how much they enjoyed contributing to discussions. One described how she felt “keen because when it’s a discussion that I’m passionate about I really wanna get my ideas out”. The two boys said sharing their ideas made them feel “happy” and “excited cos its quite fun using Talk Factory and saying your opinions”.

“I took this picture [of a PowerPoint slide showing two cartoon characters sharing ideas] because I really enjoyed that discussion. At first, I thought that talking wasn’t thinking and thinking wasn’t talking but then as I carried on the discussion my mind opened a little bit to other answers (perspectives). I still kept my answer, but I had that other side of the story that other people were arguing over”.

“These pictures are of the [small group] discussion we had about history [lessons]. Talk Factory would be good in history because you have to make a lot of notes on paper and then read other people’s. If we talked together [instead] I could write my final point down afterwards and show that I have listened to other people and improved my original thought… I change my mind all the time [during TF lessons] cos lots of people have valid points you have not thought of”.

Fig.6 A student’s photographs and commentary about creating change
Also, the students looked forward to hearing their peers’ thoughts about their contributions. One described how she felt “interested...after I’ve spoken other people will put up their hand and say whether they agree or disagree and why, so it makes me interested in the conversation”. Another described a similar feeling: “I’ve chosen curious because sometimes when I give my opinions, or someone else does, I’m curious to think about what they think and what people think about what I say”.

**Discussion**

Our findings provide new insights into what students think about using TF to support their use of exploratory talk during English lessons. Our multi-method approach (photo-elicitation, discussion of feelings and general discussion) identified themes that might be missed if only one source was utilized (in four instances a subtheme was identified from only one source of information), but also provided triangulation when the same theme was identified in more than one source, as in the majority of cases. The multi-method approach gave the four students different opportunities to explain their ideas, making it more likely we captured a valid perspective and gained a more in-depth account of their thinking.

Previous research has usually focused on the nature of the discussion (e.g., Littleton & Mercer, 2013; Kerawalla et al. 2013; Kerawalla 2015), whereas our analyses give insights into the students’ perspectives. The analyses indicate that the students had internalized important features of exploratory talk (making thoughtful and careful contributions, providing a rationale, respecting each other). They also recognised that the process of discussion and debate was useful to their understanding of an issue, for example, by providing counter arguments and incorporating others’ ideas into their thinking (Alexander 2020). They recognised that these processes could improve their thinking and writing not just in English, but also in other areas of the curriculum such as History. Additionally, the students identified effects on feelings, engagement, and motivation. There was pleasure in expressing ideas and gaining feedback, as well as from ownership, power, and control of the discussion, all of which were important to the students. Furthermore, it seems likely that without these positive feelings their engagement in the discussions would have been lower and their learning would have been less. A negative mentioned by the students was the presence of “unnatural discussions”; it is not possible to know whether this was a product of TF, but as this difficulty was not present in small group work, the problem might be caused by difficulties with turn-taking in a large group.

An interesting issue is that the use of TF as rule-based guidance provided by technology was not reported as a constraint on discussion; instead, there were comments about feeling free, even though TF was used to provide a commentary of desired and undesired speech. It could be that the initial discussions about the use of TF ensured that the students were prepared to subscribe to this guidance because they understood its potential. As TF is computer mediated, appearing more impersonal and objective, TF feedback may also have carried less emotional valence than a teacher’s comments (e.g., Frijda, 1986). Another factor was that the TF rules can be edited, as in the current study, so the rules were always meaningful to the class. In addition, after the initial sessions, the students rather than the teacher scored the discussions; by the end of these lessons the students had ownership of TF.
Our analyses, and the content of the students’ presentation, suggest that using TF to help structure exploratory talk had a powerful effect on student identity, engagement and understanding. Given the design of this study, it is not possible to specify the precise contribution of educational technology, exploratory talk, and the English classroom context to these processes. We suspect that the characteristics of the students, the way the lessons were structured, the characteristics of the teacher, the usefulness of exploratory talk for class discussions and the way TF contributed to helping structure the activities all had important contributions. From a practical perspective it is not necessary to unpack these different contributions. We hope what may be important to teaching professionals is that exploratory talk when mediated by a free resource appears to result in a very positive experience for students, and there was little or no evidence that students had a negative attitude to these lessons.

Notes
1. The Talk Factory apps used in the current study are no longer available, however a new and very similar PWA is available for free at https://talkfactory.uk and is suitable for use on desktop and most handheld devices.

Acknowledgments
We are grateful to all the students who participated in this research.

Disclosure statement No potential conflict of interest was reported by the author(s).

Funding No external funding was received.

References


Wegerif, R. (2010). Dialogue and teaching thinking with technology; opening, expanding and deepening the “inter-face”. In K. Littleton & C. Howe (Eds.), *Educational dialogues: understanding and promoting productive interaction* (pp. 304-322). New York: Routledge.


Supplementary Material. The following is a complete transcript of the students’ presentation. In the transcript, FS denotes a focal student, and S denotes members of the class in general. The students’ PowerPoint slides have been inserted into the transcript at appropriate points. Please note that copyright material in one image has been replaced with a text box. Otherwise, the content of the slides remains the same.

FS1: We have put together our experiences of Talk Factory, not just ours also the class’s, into a PowerPoint and like kind of summed up our Talk Factory topic.

FS2: And we included the pictures we took.

FS1: At the start in the beginning (see the slide below) we think we were finding it hard to understand Talk Factory and we weren’t a hundred percent certain. But once we learnt how to use it, and we had the iPads to help us make our decisions, I think, and the others think, that it helped us during the lessons to understand it. I think it also increased people’s confidence.

FS2: In this picture (see the slide above) you can see the charts and how we slowly improved. At the start we were so like rubbish (laughs). And over here (top right of the slide above) you can see some questions we asked and how they compared to the end.

FS1: At the start we didn’t know what to expect from TF and stuff so when we started to use it more often it got easier and we got more clear results and stuff.

FS2: Here (see the slide below) is like our more major discussions. We went straight into the discussions. It was quite like ooh! at the beginning but then we slowly got into it. We got to know how to use the software.
FS1: It was good. I think some people preferred to talk about it, and when we all turned our chairs around [to face the centre of the room] and spoke instead of writing it down and talking to Miss, I feel loads of people preferred that to just writing in a book because everyone else is hearing your ideas and your opinions.

FS2: Yeah and at the beginning, it says on here (slide above) as well about a safe environment. When we went into these major discussions it reminded us that we need to think before we say and act in a mature way. When we started talking about like climate change or ‘voices of our generation’ we didn’t want to offend anyone, so it really helped us to think about what we were saying. We knew we were saying it in a safe environment as we knew we were doing it with our class.

(At this point there was a student-led class activity which is not relevant to this paper so is not included. The presentation then resumed as follows:)

FS2: So you see we didn’t even know how to use it at the beginning. But when we finished (see the slide below) we are looking at how we can exceed through it (sic).
FS3: So, is there any more opinions out there that anyone wants to share?
S1: I think before we never used like to have disagree, get many disagreements. I think it’s good to disagree with someone because we have more answers. Also, now we have less bad points.
FS1: do you want to ask a question about what would happen if we weren’t introduced to TF?
FS2: Yeah and how did it improve us?
S2: English and writing.
S3: And self-confidence.
S4: I think it would have been incredibly boring without TF. [With TF] we could explore learning and how it is important to our lives.
S5: I think if we take TF away from our lessons everything will just collapse cos when we started using this everyone made better points. And the board gives us a bit of help. If we don’t have that it would just get a bit (tails off).
S6: In different lessons it has helped cos we are able to concentrate more and really think about what we’re learning. I think it’s better like this than just reading. We can give our reasons. In RE (religious education) it has helped us with debating.