

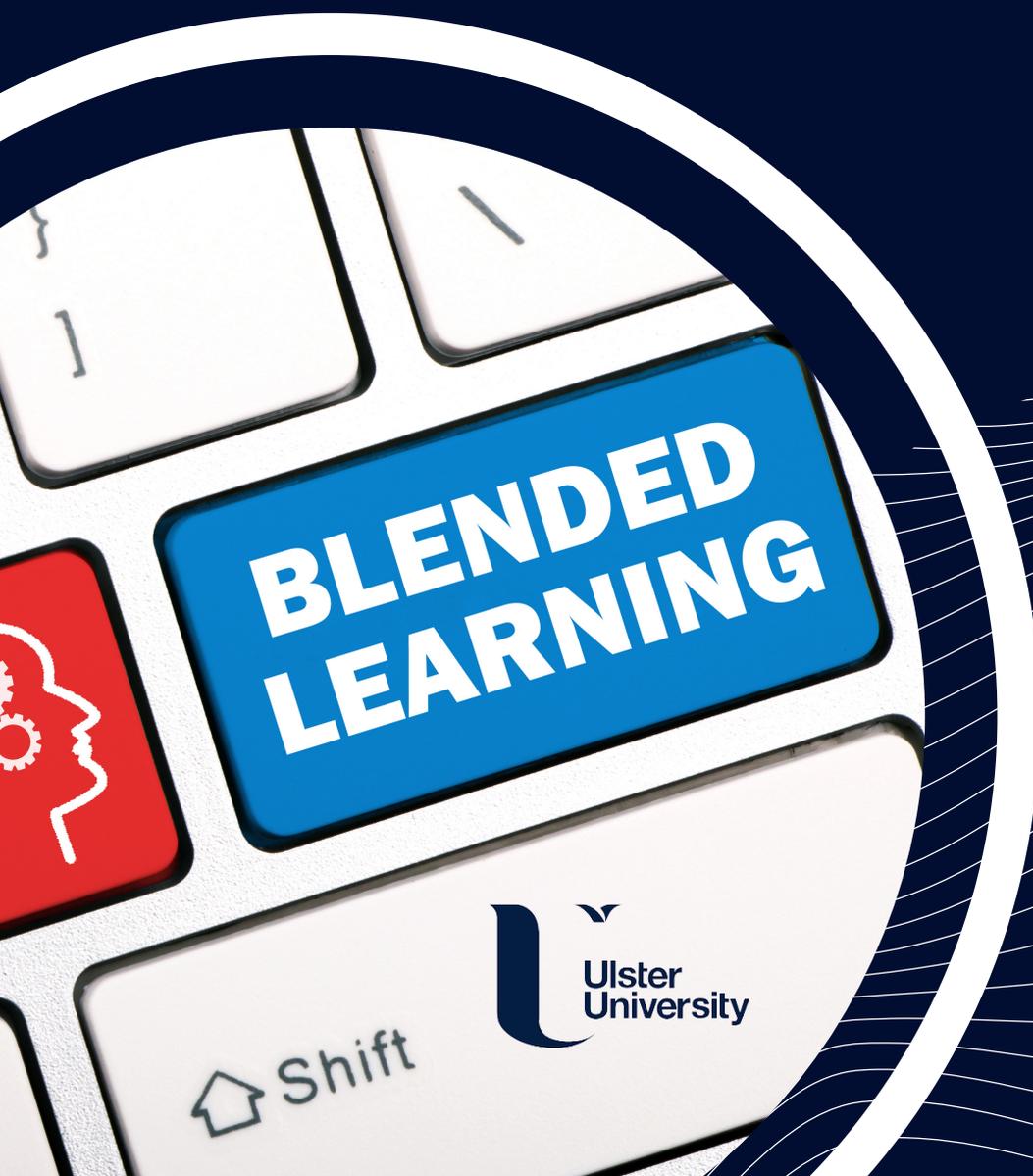
REPORT ON 'EXTENDING PUPIL ENGAGEMENT AT 16-18 THROUGH BLENDED LEARNING'

2022

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with

Cullen, C., Dougherty, M., Lenaghan, G., McKernan, D., & Wray, C.



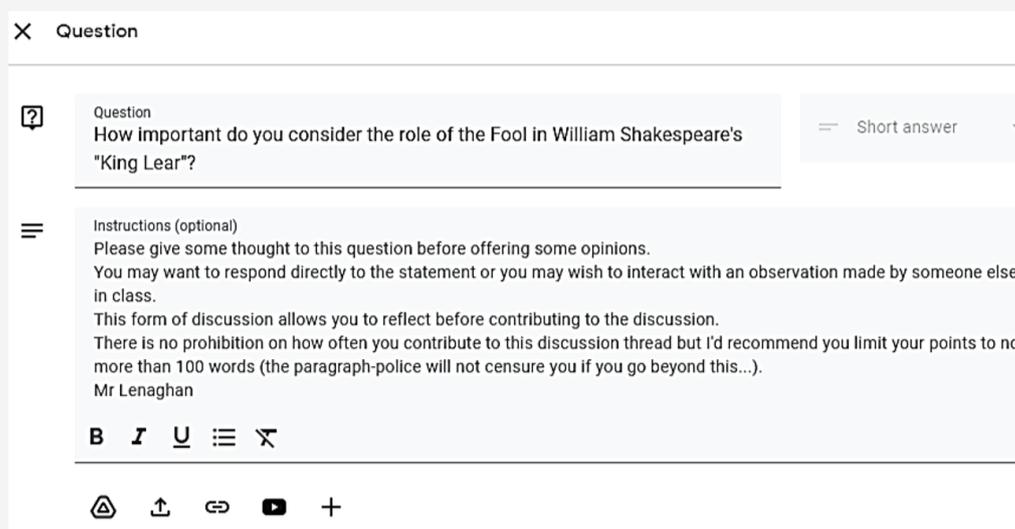
2. Extending classroom discussion online; case study 1, 'Shakespeare's King Lear'

Previous research has shown that for all the potential benefits of face-to-face classroom discussion, there are often 3 main limitations. The first is that only a limited number of pupils participate, most frequently those who are self-confident leaving others as passive observers. Secondly, even skilful teachers often look for fairly quick responses to questions, with relatively little space given to those who need to spend time formulating a reply. Thirdly, while some teachers may summarise class discussion on a whiteboard, there is rarely a written record for pupils to retain and use in the future.

These three potential drawbacks can all be addressed by extending the discussion into an online environment; the teachers involved in the first two case pilot studies were asked to implement a short project to explore this.

2.1 The first of these, presented by **Gareth Lenaghan from Ballyclare High School** was based on an **A level English** topic, the role of the fool in Shakespeare's King Lear. The teacher had already created learning resources for his class in 'Google Classroom' but had not previously used the discussion tool which allows students to post comments and react to others. The teacher explained the concept of what online discussion entailed to the class, pointing out that it involved the sharing of views in a format that would be seen and commented on by all pupils and underlining how an asynchronous discussion allowed for a much more thoughtful response than the kind of chat in social media. The topic was discussed with the class and the question on the role of the fool in King Lear agreed with them as suitably open-ended to allow a range of opinion to be expressed. In the rubric for the online discussion pupils were advised to limit their comments to 100 words, given 2 weeks in which to respond to the question and advised of the importance of courtesy in making responses to other pupils' comments.

At the end of the pilot study he asked the 12 pupils in the class to complete an online anonymous survey of their experiences.



The screenshot shows a Google Classroom question interface. At the top, there is a close button (X) and the word 'Question'. Below this is a question card with a question mark icon, the text 'Question How important do you consider the role of the Fool in William Shakespeare's "King Lear"?' and a dropdown menu set to 'Short answer'. Below the question card is an 'Instructions (optional)' section with a hamburger menu icon. The instructions text reads: 'Please give some thought to this question before offering some opinions. You may want to respond directly to the statement or you may wish to interact with an observation made by someone else in class. This form of discussion allows you to reflect before contributing to the discussion. There is no prohibition on how often you contribute to this discussion thread but I'd recommend you limit your points to no more than 100 words (the paragraph-police will not censure you if you go beyond this...). Mr Lenaghan'. Below the instructions is a rich text editor toolbar with icons for bold (B), italic (I), underline (U), bulleted list (≡), and strikethrough (X). At the bottom of the interface is another toolbar with icons for image upload (triangle), link (up arrow), link (chain), video (play button), and a plus sign (+).

2.2 Pupil and teacher views of the online discussion

The data that follows is drawn from pupil responses to an anonymous online survey carried out by the teacher.

Most pupils (two thirds) used their phones as the primary means of viewing and commenting upon the material.

Precisely half of the class accessed the on-line discussion in school during Private Study whereas the other half accessed material when they were at home.

Two thirds of the group stated that this was their first experience of using on-line discussions for schoolwork

Ten out of twelve members of the class posted a response to others as well as offer an opinion of their own.

90+%

Using a scale of 1 to 4, where 1 means “a great deal” and 4 means “not at all”, eleven pupils (90+%) stated that they believed the on-line discussion helped them to express their views on the topic chosen for consideration

75%

Using a scale of 1 to 4, where 1 means “a great deal” and 4 means “not at all”, nine pupils (75%) stated that they believed the on-line discussion helped them to understand the topic chosen for consideration (by circling numbers 1 or 2 on the scale)

Seven of the pupils suggested that they would like to have a discussion running as part of every topic they study.

The teacher added his own reflections of the experience. He noted the following key points;

- Positive impact upon the more reluctant contributors to discussion in class
- Pleasing tone of courtesy and challenge when interaction took place
- Thoughtful and nuanced responses were evident in everyone’s contributions
- Sustained evidence of independent learning
- Negligible impact upon workload.

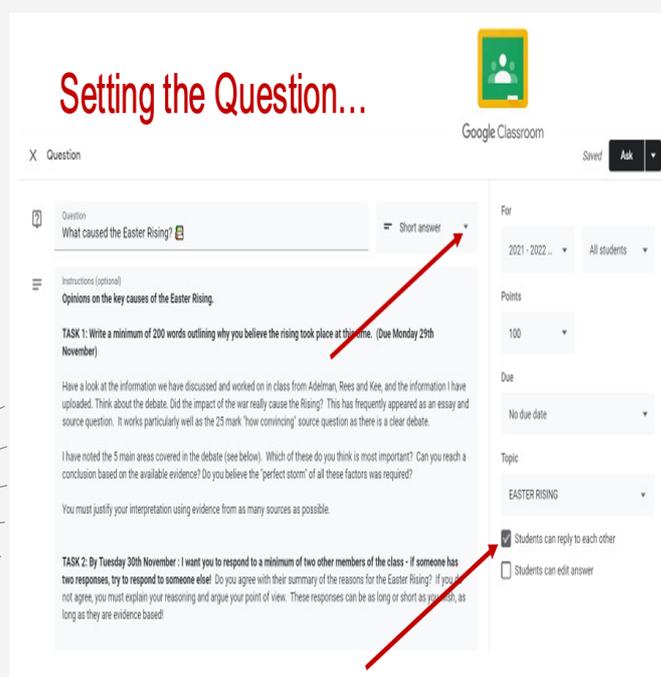
In this case study, unlike some online discussions, the teacher reported that he had intervened very little in the discussion and described his role as holding a ‘watching brief’.

3.. Extending classroom discussion in history; case study 2, 'The Causes of the Easter Rising of 1916'

In this case study, 17 pupils (10 boys and 7 girls) in their last year of school were studying aspects of Irish history as part of their course in **A level history**. **Melanie Dougherty**, the teacher who carried out the study, noted that prior to the online discussion, most exchanges of view involving pupils were carried out in real time, either face to face in the classroom or, using the real-time application google meet.

3.1 Setting the question

Unlike the previous case study, the pupil question was broken into 2 separate components, the first asking for a response to the set question by a given date and then a separate activity, with deadline for interacting with other pupils' comments.



In this example, pupils were referred to essential reading which was stored in a folder in google classroom and which was designed to link to possible exam questions on the interpretations of contemporaries and historians, with pupils reaching conclusions about the validity of interpretations. It should be noted that preliminary discussion of the topic had started in class and the online task was seen as extending pupil understanding.

MD noted that for the first task when pupils were asked to post their own views on the main causes of the Easter Rising, that

- All pupils were keen to participate.
- Their online contributions were impressive.
- Class and extra online resources were used to reach conclusions.
- Online responses from some pupils were more detailed and insightful than their classroom responses would usually be.

In terms of pupil learning around the second task where they were asked to respond to others, MD commented as follows;

- Pupils did engage with responses and I tried to say as little as possible in the replies so that they took ownership of the activity.
- The engagement could have been more in-depth in some cases.
- Class discussion within the classroom increased – ground-work done at home.
- The activity prompted some quieter pupils to have the confidence to interact in the classroom.

3.3 Pupil and teacher views of the study

When the pupils were asked to express their views anonymously at the end of the study, their teacher summarised the key points as follows;

- In terms of ease of use – no issues.
- Use of mobile phone as key device (Google Classroom App).
- Dyslexic pupils used speech to text function.
- Pupils all said they appreciated having access to the answers provided by all their peers and this motivated them to perform to the best of their ability.
- Most pupils admitted that they improved their responses after reading other responses.
- All pupils said they enjoyed the task and would like to participate in online discussion more regularly.
- All pupils said they feel this is a good way to interact with, and learn from, each-other.
- All pupils said they would be happy to collaborate with pupils from another school in an online discussion.
- Pupils who expressed concerns about speaking out in class said they preferred this method of discussion.

The teacher summarised her views on the study with these succinct points

- A simple method to aid autonomous discussion and debate amongst pupils.
- Pupils who tend to be shy and unwilling to engage in classroom debate provided much better responses in the online environment.
- Pupils enjoyed seeing the conclusions of their peers.
- Motivation to produce the best answer possible because it was to be peer-reviewed.
- An easy way to encourage discussion, beyond the constraints of normal classroom learning – quieter pupils excelled.
- Time and space for pupils to reach conclusions using the information and guidance provided and/or to research from other sources.
- This question worked but there are other areas that would have prompted more varied responses and encouraged pupils to challenge view-points more than they could here.
- Learners' engagement and confidence can increase when they have the opportunity to showcase their work via a different medium.
- Use of blended learning works in engaging pupils and ensures that all our learners are given the chance to contribute in a way that best suits them!

3.4 Conclusion

In subjects like **English and History** where pupils need to weigh evidence and think carefully about different interpretations of individuals or events, data from the 2 case studies suggests that online discussion can give more pupils, including those with dyslexia, the chance to contribute more than would be the case if discussion was confined to face to face discussion. The process of reading and composing responses, and of reading other pupils' comments, contributed to deeper levels of understanding and a more level playing field for participation. In that sense it made classrooms more inclusive and created a prototype community of practice where pupils were stimulated to do their best. The use of mobile phones and good levels of wifi connectivity in school and at home meant that there were no technical problems in accessing the online discussion or the resources. Further work with pupils from less advantaged backgrounds would be valuable to assess whether the positive conclusions reported here were comparable in other schools and settings.

4. The use of instructional video and personalised learning in Life and Health Sciences

Danielle McKernan, ELearning coordinator from **St Patrick's Academy in Dungannon**, explained how the school had adopted ideas from the Modern Classroom, aligned with Keller – Personalised System of Instruction (1968) where teacher-created instructional videos replace lectures, students advance at their own pace, while teachers spend class time providing targeted support. Course content is divided into bite-sized, lean content with a maximum duration of 10 minutes. Direct instruction videos have embedded questions throughout the video to not only maintain attention but to check pupils' understanding (using the digital tool EdPuzzle). Formative assessment consists of automatically marked google forms, with data available to the teacher for analysis and responsive teaching. Mastery is reached in assessments when a score of 80% is achieved. Pupils not reaching this threshold conference with the teacher for personalised, targeted feedback and support and next steps are signposted. A public facing pacing-chart enables the teacher to keep track of pupils' progress and allows pupils to compare their pace with peers and to know which peers have successfully mastered a lesson. Peer collaboration based on working in small groups, both face to face and online are a key element in this approach.

In the school a mix of synchronous and asynchronous tools were used to secure pupil participation, leading to higher levels of engagement.

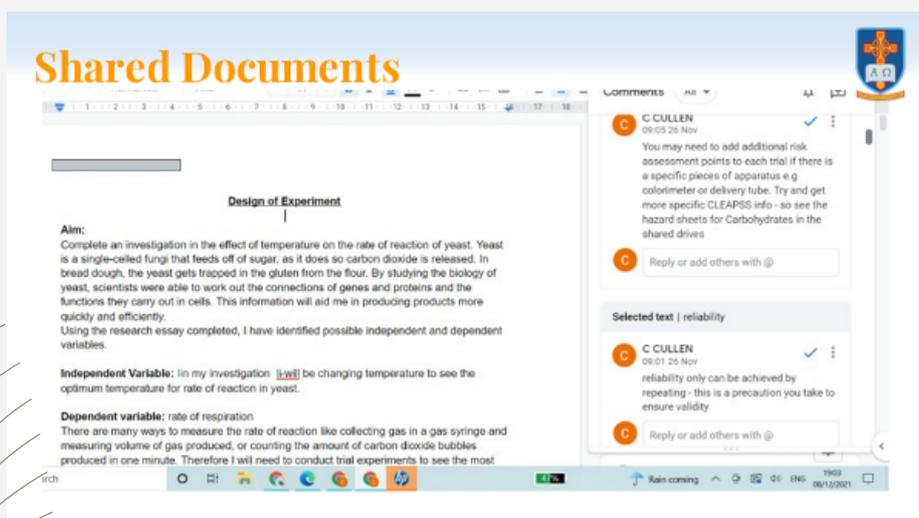
4.1 In Life and Health Science A level, where much of the work requires pupils to work towards a portfolio, **Celine Cullen** reported that the gap between face to face classes which were held on Thursday and Friday meant that asynchronous online interaction between face to face lessons was a very good way of monitoring pupil progress and providing personalised feedback. Core resources were made available to the group to ensure consistency in the quality of the task's key instructions and enabled pupils to review these instructions later as their individual work developed and they were more ready to process all instructions more deeply.

Core elements of the blended learning approach included the following on-line resources:

- Google slides – key concepts and ideas are available for pupil note making, and weblinks/ youtube videos are embedded in the slides
- Exam Board resources – specification, candidate mark record sheets etc
- Shared Drive – link to key resources are accessible in one place
- Weekly tasks are assigned with due dates.
- Video explanations are recorded by teacher following class discussion to reinforce assessment objectives and to facilitate absent pupils
- Live lessons are available for absent pupils.

However, it wasn't enough to have a repository of resources; intervention by the teacher was required to help pupils navigate a path through the materials as pupils worked at different paces and due to absenteeism and levels of engagement, were at different stages. This personalised approach made a big difference. For example, pupils could be drafting work on a shared google doc between the face to face classes and the teacher could provide rapid response to ensure pupil understanding. As the teacher was "shared" into the pupil's document and had access to the live, up-to-date version, timely feedback during the developmental stages of the pupils' work could be provided.

This was particularly true in the case of pupils who were absent from school because of COVID-19.



The screenshot shows a Google Docs interface. The document title is "Shared Documents" in orange. The main content is a "Design of Experiment" section with the following text:

Aim:
Complete an investigation in the effect of temperature on the rate of reaction of yeast. Yeast is a single-celled fungi that feeds off of sugar, as it does so carbon dioxide is released. In bread dough, the yeast gets trapped in the gluten from the flour. By studying the biology of yeast, scientists were able to work out the connections of genes and proteins and the functions they carry out in cells. This information will aid me in producing products more quickly and efficiently.
Using the research essay completed, I have identified possible independent and dependent variables.

Independent Variable: In my investigation I will be changing temperature to see the optimum temperature for rate of reaction in yeast.

Dependent variable: rate of respiration
There are many ways to measure the rate of reaction like collecting gas in a gas syringe and measuring volume of gas produced, or counting the amount of carbon dioxide bubbles produced in one minute. Therefore I will need to conduct trial experiments to see the most

On the right side, there is a "Comments" panel. The first comment is from C CULLEN, dated 09:05 28 Nov, with the text: "You may need to add additional risk assessment points to each trial if there is a specific pieces of apparatus e.g colorimeter or delivery tube. Try and get more specific CLEARSS info - so see the hazard sheets for Carbohydrates in the shared drives". Below it is a "Selected text | reliability" section with another comment from C CULLEN, dated 09:01 28 Nov, stating: "reliability only can be achieved by repeating - this is a precaution you take to ensure validity".

Feedback from pupils about this type of learning showed that they appreciated the ongoing support, the way that errors were picked up early on and the way that the blended learning helped them to meet the weekly deadlines. One of the pupils commented

'Without the online learning, the tasks would have been a lot more difficult to progress through, as I would then have to go to Mrs Cullen when we were both able to set the time aside rather than sending Mrs Cullen a message to get my queries about the assessments. The shared documents provided more than sufficient support while carrying out tasks that I was primarily finding difficult. The use of google classroom, I think, is the best way to support any student during the ongoing pandemic as we are able to progress with our learning to ensure we don't fall behind. It also eases a lot of stress when seeing everything that you have to complete is completed. Any written guidance that we were given allowed us to complete each task to the best of our own ability and showed the mistakes that we were making to be able to correct them and not make them in the future.'

4.2 Pupil and teacher views of the approach

Celine Cullen analysed the impact of the approach on pupils who engaged with the asynchronous material and opportunities for formative feedback and noted a positive trend. Some key findings;

- Pupils who engaged with online materials all achieved 85%+, even if their face-to-face attendance was very low e.g. 27%.
- The highest score achieved by pupils who did not engage with the asynchronous provision between sessions was 65%. This was achieved through support in the synchronous space only.
- Celine Cullen therefore believes an asynchronous channel parallel to the synchronous space has the potential to improve pupils' outcomes.
- Celine Cullen identified the need for an active teacher presence in the asynchronous space to maintain pupils' motivation between synchronous sessions and advised on managing expectations for the timing of responses.
- With an active presence required, Celine Cullen felt it did have some impact on her workload during the process but final assessment of the work was very quick as she was very familiar with the work and the higher quality of the pupils' responses made the final marking process a highly fulfilling experience.

4.3 Looking ahead Mrs Cullen, has identified E-Portfolios using Google Sites as an effective way for pupils to publicly demonstrate their learning to both peers and the teacher. The layout and section pages of the site would enable better organisation of the pupils' learning journey and their progression could be exemplified within a single structure.

Potential for future - Pupil perspective

Pupil 2 - I certainly feel that the google sites would be an excellent tool for presenting the digital portfolio as it keeps all of your progress and assignments together and it is perhaps presented neatly and professionally. It also enables students to continue practising ICT skills which is an essential part of our modern world and this would have greatly benefited us for going to university.

Pupil 3 ...it would be useful if it was not the first time I used the Google sites

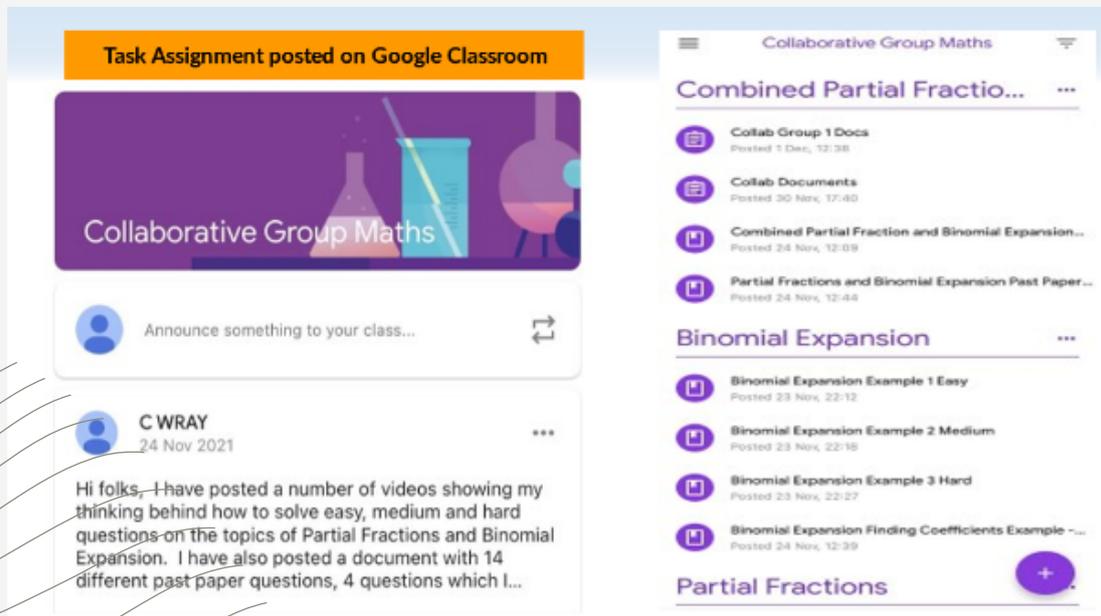
Teacher Review: Based on the experience it was felt that while it is a very user friendly tool, initial training would support engagement and build confidence

4.4 Collaborative problem solving using blended learning in A level Maths

Colin Wray presented work he was doing with his **Maths** class and which was built around **problem-solving with collaborative learning groups** both in class and online. Small groups of **sixth form pupils** formed learning communities in a synchronous space to support each other and Colin Wray extended this provision to include an asynchronous channel to enable group problem-solving between synchronous sessions. Colin Wray aimed to create an environment whereby pupils could develop self-regulation skills and a sense of agency over their own learning. His use of Google Classroom and the collaborative “share” feature enabled all pupils to be in the same live document working together. (e.g. Google Slides/Sheets/Jamboard) but also, from a distance, he could monitor and oversee the pupils' progress. This helped with pupils' accountability, pacing and motivation. This role of overseer instead of active participant and reviewer was important to ensure pupils had a sense of autonomy and ownership of their learning.

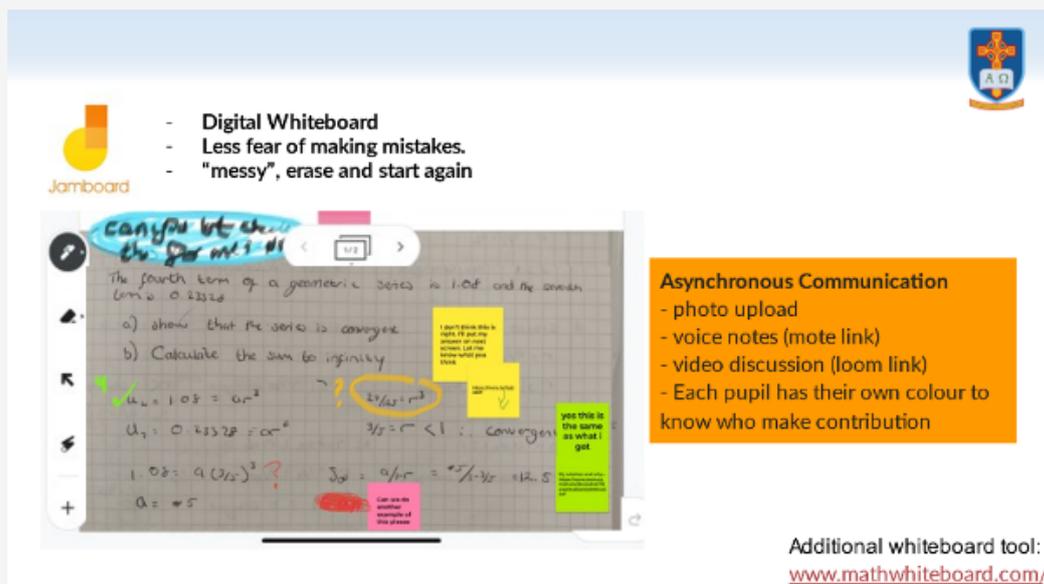
4.5

Colin Wray gave an example of the kind of tasks he had set in the shared google classroom for the pupils to work through independently. These included videos, walkthroughs of questions and used a “gradual release of responsibility” approach. I do, We do, You do to scaffold learning and progression. The teacher recorded videos using his iPad and own handwriting using digital inking with the apple pencil.



4.6 Pupil and teacher views of the approach

- The intention of the task was for pupils to continue their classwork in a supported peer environment, however the pupils extended the project by also leaning on peer support with earlier topics from the course. Colin Wray noted the retrieval practice benefit of this approach for not just the supported but also the supporter.
- Colin Wray had provided a framework for pupil responses to be shared using Google slides, however the pupils adapted their communication method and opted for a “whiteboarding” approach instead.
- Pupils reported the whiteboard approach allowed them to graphically communicate their thinking, to annotate directly onto the area with digital ink, which felt more intuitive and also to use multimedia to explain their thinking through voice notes and video explanations.
- Pupils reported the experience as highly valuable and reduced their anxiety with mathematics as they had a peer support network between classes to asynchronously problem-solve and also identify questions for further study in the synchronous session. This ensured all synchronous sessions already had a focus when the group met.
- Colin Wray commended the resourcefulness of the pupils in their appropriate choice of a highly effective digital tool for collaboration.
- Colin Wray concluded this approach has helped him to support his pupils as he is not always required for follow-up assistance and support. The pupils can often manage this independently within their groups.



Digital Whiteboard
- Less fear of making mistakes.
- "messy", erase and start again

Asynchronous Communication
- photo upload
- voice notes (mote link)
- video discussion (loom link)
- Each pupil has their own colour to know who make contribution

Additional whiteboard tool:
www.mathwhiteboard.com/

The screenshot shows a digital whiteboard with the following content:
- A title: "can you be show the sum of it"
- A problem statement: "The fourth term of a geometric series is 1.08 and the seventh term is 0.23328"
- Questions: "a) show that the series is convergent", "b) Calculate the sum to infinity"
- Handwritten work: $u_4 = 1.08 = ar^3$, $u_7 = 0.23328 = ar^6$, $1.08 = a(2/3)^3$, $a = 1.5$, $3/2 = r < 1 \therefore$ Convergent, $S_{\infty} = a/r = 1.5 / (2/3) = 2.25$
- Colored sticky notes with feedback: "I don't know this is right, it's not the answer or not correct, can you show what you think", "you this is the same as what I get", "Can use the answer example of this answer"

In line with the overall approach of allowing pupils to work at their own pace, the teacher illustrated how each pupil had a check list of work to be done.

Google Sheets

- Peer comment
- Collaborative (Read/Write access)
- Cells colours
- Links to other google documents e.g. jamboard embedded

	MUST DO				SHOULD DO				ASPIRE TO DO										
	Partial Fractions	Partial Fractions	Binomial Expansion																
Name	1	2	3	4	1	2	3	4	1	2	3	4	5	6	26/11	2/12	10/12	14/1	21/1
Padi	<input type="checkbox"/>																		
Michael	<input type="checkbox"/>																		
Niall	<input type="checkbox"/>																		
Megan	<input type="checkbox"/>																		
Sean	<input type="checkbox"/>																		

What we've learned...



Choice

Release control and allow pupils to choose the tech tool they prefer. They now have the skills, let them use the technology that works for them.

Authentic Collaboration

When we are the facilitators and allow the space and responsibility to collaborate, it is a meaningful and impactful experience and sets them up as future life-long learners.

Comments from pupils in the class highlighted the value of peer learning and group support

Impact

I feel less anxious when we do a new topic and I don't "get it" first time.

Sometimes my group can explain it in a way that is easier to understand.

I'm getting better at maths

I wish I had more time out of study hall to work in groups instead of in silence

I don't mind asking my peers for help as we have signed up to help each other

5. Conclusion

These 4 studies, all undertaken with classes working towards high stakes external examinations suggest that there is scope for innovative practice in blended learning and this can impact on both pupil attitudes towards learning and to attainment. Further work on blended learning with teachers of students aged 16–18 has been planned for February–March 2022 in Northern Ireland and, later, with other age groups in REBEL partner countries. Further details can be found at rebelproject.eu



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