

# A critical evaluation of the role of digital innovation in professional practice

## Introduction

In a time when digital technology plays a big part in everyday life, some may argue that it was only a matter of time before educators take advantage of digital technology and use it in their teaching to enhance the students learning experience (Torchia, 2022). Some may argue that educators are too reliant on the use of technology in classrooms in today's society, Stevens (2018) states that the use of digital technology is taken for granted by educators in all areas and stages of education. In contradiction to this, Vahedi, Zannella, and Want (2021), reported how students favourably view when teachers include technology into their lessons but look negatively upon teachers who discourage the use of technology to enhance their learning. This supports Ragan (2014) who found that students in higher education often bring their own laptops and technology to the lectures in order to support their learning.

This report will look at the positive and negative impacts of technology in the classroom and how technology can be used in different ways to enhance the learning experience of students in the post compulsory sector. The focus will be on the use of technology in assisting with collaborative working in the education, looking at the challenges and the benefits in using technology compared to traditional collaborative working teaching strategies.

## Literature review

As the focus of this literature review is collaborative working through the use of digital technology in education settings, it would be beneficial to first find a definition of what collaborative learning is. Guine (2020) described collaborative learning as a teaching strategy where the students are instructed to work together to achieve a common learning goal. Collaborative learning is supported by the theories of Vygotsky (1978) and his research on the zone of proximal development (ZPD) which is the area between what the student can do by themselves and what they can do with the help and support of a more knowledgeable other (MKO) (McLeod, 2024). A more knowledgeable other can be a staff member, family, or their peers, this would support the use of collaborative learning as students are supporting each other to reach a common goal. Duckworth (2014) states that collaboration is an empowering tool that can ignite creativity and enthusiasm into the participants, showing that there are many benefits for collaborative working in education settings. With this in mind, it can be seen that collaborative working is not a new idea, however the way that this takes place has changed over time.

In today's society so much of our lives take place within the digital world. Reedy and Parker (2018) describe how technology impacts everyday life, from the way in which students learn to the sharing of information through social media. It is also stated that the jobs that educators are preparing students for do not yet exist due to the fast-changing nature of the digital world. If this is the case, then using digital technology and media in the classroom could be argued as a way to prepare the students for their future careers using digital technology.

Sandu and Taylor's (2024) research look at the impact that the Covid 19 pandemic had on the use of digital technology in education in Wales. They reported that with widespread educational settings closing, the use of digital technology for education became the norm for all levels of study, however there were vast gaps in levels of engagement that were put down to the familiarity of the teaching staff and students in using technology for education purposes. It was also suggested that the 'digital divide' between those who had access to technology at home that would allow them to access their learning and those that did not played a part in the engagement of learners, thus, leaving a divide in attainment from those who were able to continue their studies

remotely and those who missed key education (Ueno, Dennis and Dafoulas, 2023). From the view of collaborative learning this also meant that students had to find new ways to collaborate with their peers during this time. It could be suggested that for many students and educators this was a new challenge that they had not faced previously as, generally, all formal education lessons took place in person allowing for the collaborative learning to happen face to face.

Rennie, Smyth, and Mason (2020) describe collaborative working as a sense of community that is linked to the groups interactions and feeling included, they also state that it is formed through shared experiences which helps to foster solidarity and supports them in reaching a common goal. Rennie, Smyth, and Mason (2020) go on to say how this can be achieved through digital community, however for collaborative learning to be successful online then there needs to be a bond between the participants and a desire to reach a common goal. When looking at this from the aspect of online learning then it could suggest that if there is not already a bond and trust between the participants of the collaborative work then it would make working together online more of a challenge.

Since the global pandemic, many education settings now offer blended learning, which offers a combination of both face to face and online learning for their students (Rennie, Smyth and Mason, 2020). Mekhitarian (2021) however suggests that the effectiveness of blended learning in education settings is based on the use of 'Digital Citizenship', where students are made aware of their expectations online, for example, showing respect to the staff and their peers but it also establishes norms for blended learning that are crucial for collaborative learning, peer feedback and group discussion. This is shown in the professional standard "Demonstrate dignity, courtesy and respect towards others" (Welsh Government, 2017). With this in mind, it would show that the need for the students to have a knowledge of digital citizenship is vital to the effectiveness of digital learning.

The use of digital education can also bring ethical considerations into the spotlight, with information being available online then it allows for plagiarism and piracy (Gupta, et al, 2022). The introduction of the term "Netiquette" highlights the need for there to be a manner of behaviour when working online, both in interactions with others and also in the manner in which you conduct yourself online. Plagiarism for example is an

area within the education field that is a growing concern. Ofqual (2023) found a growing trend in the use of plagiarism by students in their work, with the number tripling between 2021 and 2023. This can be identified through programmes such as Turnitin, which highlights the plagiarised work, however for some institutions this is not used, relying on the student's ethics and morality not to plagiarise others work.

When looking at the different collaborative tools for online learning, it could be suggested that the use of group work could cause issues in regard to safeguarding the students and keeping the students protected from online bullying and harassment. A study by Vaillancourt, et al. (2021) found that although levels of bullying declined in the majority of areas due to the use of blended learning during the pandemic, the prevalence of online bullying was raised. It could be implied that this is due to the fact that students were unable to meet face to face and so were limited to interacting online where the online bullying could take place. Beauchere (2020) found that in a study conducted by Microsoft, the issue of bullying and inappropriate behaviour did not stop when education moved online due to the pandemic, the mode of the behaviour changed but four in ten people that were asked about the topic claimed that they had been involved in online bullying.

When using some collaborative tools, it is possible to monitor the communication between students. Using tools for example the institutions email channels and the noticeboard on Teams allows for the monitoring of what is said between the cohort, this can limit negative communication between the group as what is said is visible to the whole group. In situations however where the chat moves on to other devices, for example messaging, there is no way to monitor the situation. Many educators make use of the 'breakout room' function on Teams, which allows students to move into groups to collaborate on their work. This could be an area that could allow for negative communication as it is not monitored or recorded and although the staff member can access the rooms at any time, as they can only monitor one room at a time it allows for issues in the other groups during unsupervised times. This is covered by the professional standard "Demonstrate commitment to learners, their learning, safety and well-being" (Welsh Government, 2017) as the practitioner is committed to keeping their students safe and is protecting their well-being.

When using digital collaborative tools, it is important to ensure that all of the students have the ability to connect with the digital activity. Ofcom (2022) identify three strands of digital deprivation in adults that should be taken into consideration when planning activities that include the use of digital technology. The first barrier identified is access, this refers to a person's ability to access the information, a barrier for this could be the lack of internet access for example or the lack of suitable equipment (device poverty) needed to complete the activity. This could lead to digital exclusion for the student in comparison to their peers. The second strand is identified as ability, this refers to the student's skills and confidence in using technology to participate in the lesson, if they do not have the skills needed to participate in the digital technology then they would be disadvantaged compared to their peers. The final strand that Ofcom (2022) identified was affordability, which identifies the challenges when a person cannot afford reliable internet connection, or those who put themselves in financial hardship to access the internet. For students within the university this would be less of an issue with the university providing free internet access, however for those who are expected to participate in blended learning, teams' lectures, or digital activities at home, this could be a struggle. This is supported by Ueno, Dennis and Dafoulas (2023) who reported that internet non use and digital deprivation, caused by a variety of different factors, has a negative impact on productivity and in relation to students would put them at a disadvantage to their peers. It could then be argued that this needs to be taken into account when planning activities, both in the classroom and through blended learning, to ensure that all students are able to access the information and participate to help to reach their full potential.

The potential for enhances learning experiences by using digital technology is huge, however it must not come at the cost of student's well-being, participation, or levels of student engagement. "Digital technology will change the roles of learning professionals, and require them to develop new skills, and will also (when used effectively) enable new approaches and enhance the learning experience" (Welsh Government, 2019), suggesting that the use of digital technology is only effective and beneficial to students in lessons if it is used correctly and effectively, this covers the professional standard "Critically reflect on own values, knowledge and skills to improve learning" (Welsh Government, 2017), as educators need to look at their own digital skills critically and ensure that they are meeting the digital needs of their students .

### Selection and Justification

Connectivism is a theory where the learner is an active participant in their learning, gaining information from different sources and of different perspectives (Kremers, 2023). The theory of connectivism states that students learn by building networks of knowledge, sharing ideas and finding and critically evaluating the reliability of sources. Connectivism links with the teaching strategy of collaborative working as it states that learning is no longer an internal process, that students should have the opportunity to share knowledge via technology (Lynch, 2018). Dziubaniuk, Ivanova-Gongne, and Nyholm (2023) describe connectivism a learning environment where the student can build on their knowledge through online sources and interaction. This too implies there is a benefit of collaborative learning in the connectivism theory of learning.

With this theory in mind, I chose to look at the different methods of collaborative working with the use of digital media. The use of collaboration with students is one of the five principles of the Well-being of Future Generations Act (Welsh Government, 2015), it states that in the post sixteen sector collaboration is key to sharing experiences, views, and knowledge. Collaboration also builds on the teaching standard “Build positive and collaborative relationships” (Welsh Government, 2017) which focuses on the positive, professional relationships between the students and the lecturer in this case. By using collaborative tools, it is inviting the students to share their expertise in the subject area and opens the topic up for discussion which can lead to positive collaborative relationships. This is also supported by aim seven of the Digital 2030 framework that states that “A culture of collaboration ensures that information and best practice are shared to drive effective use of digital skills to support leadership, learning and business processes” (Welsh Government, 2019).

There are a wide variety of applications that can enhance the learning of the students and help them to build on their prior knowledge, for example learning quizzes, which are an enjoyable way for the students to test their current knowledge and to expand their knowledge on a topic. These activities are both enjoyable and competitive for the students. For this lesson however the activity was about the students drawing on their own experiences of the use of technology and digital programmes in their education and in their experience in practice, so a quiz type activity would not be appropriate. For this activity I chose to use a word cloud activity so students can share their ideas

with each other and then as a group we could elaborate on those answers verbally in the session, in order to come to this decision, the TPACK framework was used to help plan the activity (Kurt, 2018).

TPACK is a model of integration that proposes the use of content, pedagogical and technological knowledge to integrate the use of ICT into the teaching and learning process (Salas-Rueda, 2020). TPACK also ensures that the use of technology is based on pedagogically sound, content driven and forward-thinking approaches in order for the use of technology in the classroom to be beneficial (Sullivan, et al, 2024), therefor the use of technology should be a natural progression for the lesson and based on context, content and the need for the use of technology over what could be done without the use of technology. Scherer, Tondeur and Siddiq (2017) found that there was not enough definition between the three areas of the TPAC model and therefor there was a lot of overlapping of the areas, blurring the distinctions between the three areas, therefor, using the TPACK model for planning an activity, one must be mindful of the overlapping of the areas and the impact that may have on the planning process and activity.

For this session, the content knowledge was based on the digital competency framework in Wales and how it effects the students in classrooms today. The next point to look at was the pedagogical knowledge which focuses on how you would teach the information, as the session was taken online there were a variety of different teaching methods used, for example group discussion, role modelling, direct instruction and group work in the break-out rooms on teams. Finally, the focus was on the technology that was going to be used, as this session was online and was taught via teams then the students were already using technology to access the lecture but in order to share ideas and experiences it was decided that the use of a word cloud followed by a group discussion would be the most effective method of the students sharing their knowledge and experiences. The word cloud activity allows for the merging of all three strands to come together.

## Application



# Lesson Plan

|                                                                                                                                                                                                                                                      |                                  |                                           |                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------|-------------------------------|
| <b>Topic:</b> Using technology to support literacy and numeracy skills development                                                                                                                                                                   |                                  | <b>Class:</b> Education studies – Level 5 |                               |
| <b>Date:</b> 18 <sup>th</sup> November 2024                                                                                                                                                                                                          | <b>Length of lesson:</b> 3 hours |                                           | <b>Number of students:</b> 12 |
| <b>Resources required:</b> <ul style="list-style-type: none"><li>• Power point</li><li>• Phone/tablet</li></ul>                                                                                                                                      |                                  |                                           |                               |
| <b>Aim of Lesson</b> <ul style="list-style-type: none"><li>• An introduction to the DCF and how it can help with literacy and numeracy development.</li></ul>                                                                                        |                                  |                                           |                               |
| <b>Learning Outcomes – The Learners Should Be Able To:</b> <ul style="list-style-type: none"><li>• Identify the key elements of the DCF.</li><li>• Evaluate the effectiveness of digital tools in developing literacy and numeracy skills.</li></ul> |                                  |                                           |                               |
| <b>Previous student knowledge required for the session:</b> <ul style="list-style-type: none"><li>• Students have a basic knowledge of the digital, numeracy and literacy framework.</li><li>• Previous experience of the DCF framework</li></ul>    |                                  |                                           |                               |

**Anticipated difficulties (if applicable):**

Technical issues – The power point not working as intended or not loading. If this happen then I will use the version on teams/moodle. This lesson is an online lesson so there is the possibility of issues with teams. If this happens then I will get technical support from the university.

The QR code does not work for the word cloud. If this happens, they the learners can discuss their ideas in pairs and then feedback to the group.

The QR code does not work for the link to the DCF framework, if this happens then I can send the link to the documents on the team's chat so they can use that to access the DCF.

Lack of learner engagement – The learners not wanting to engage in the tasks in the lesson. In this situation I will role model what I am asking them to do and encourage their involvement.

**Professional Standards (where are these being met within the session)**

**Value and promote diversity, equality of opportunity and inclusion.**

- Ensure that the group are respectful of each other, challenge any disrespectful behaviour.

**Understand the importance of the Welsh culture and language as a bilingual nation.**

- Incidental Welsh in greetings
- All slides are bilingual.

**Demonstrate dignity, courtesy, and respect towards others.**

- Role model respect for learners in the classroom
- Listen and respect the feedback from the learners following group discussion.

**Maintain and update knowledge of my subjects and how best to teach and assess them.**

- Using up to date research to inform the lecture.

**Plan and deliver effective learning, teaching, and assessment.**

- Ensuring the lesson plan is complete and able to be followed by others.

**Enable learners to share responsibility for their own learning and assessment.**

- Question and answer at the end of the session to confirm learning.

**Critically reflect on own values, knowledge, and skills to improve learning**

- I am challenging my own learning by using new digital techniques and teaching online as well as in person.
- Reflecting on my own practice, the feedback from the learners and the lecturers

**Demonstrate a commitment to sustainability.**

- I will not be using any paper resources to reduce waste and promote sustainability.
- Show how you can support learners in the classroom while promoting sustainability.

**Lesson Detail:**

| Stage               | Focus                                            | Strategy                                                                                                                                                                                                                                                                                                                                                                    | Time    |
|---------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>Introduction</b> | Recap of last weeks lectures                     | Discussion about what was covered in last week's lecture.                                                                                                                                                                                                                                                                                                                   | 5 mins  |
| <b>Development</b>  | Digital Competency Framework                     | Students to use the QR code on their devices to take them to the DCF on hwb.                                                                                                                                                                                                                                                                                                | 5 min   |
|                     |                                                  | Put students in the breakout rooms to pick out key points of the DCF. Students to use the whiteboard function to note key points.                                                                                                                                                                                                                                           | 25 mins |
|                     |                                                  | Feedback their findings.                                                                                                                                                                                                                                                                                                                                                    | 10 mins |
|                     | Personal experience                              | Mentimeter sharing what they have experienced using the DCF in their practice. Group discussion about the results.                                                                                                                                                                                                                                                          | 15 mins |
|                     | Digital games that promote literacy and numeracy | Task – search app store on your device for literacy and numeracy games. Download a small selection of games and play at least 3 levels of the games.<br><br>They need to consider if the game would be appropriate in an education setting. How they support literacy and numeracy development. If they would be suitable for a learner with ALN and what are the drawbacks | 60 mins |

|                           |                     |                                               |         |
|---------------------------|---------------------|-----------------------------------------------|---------|
| <b>Plenary/conclusion</b> |                     | Feedback their findings to the group.         | 30 mins |
|                           | Question answer and | Allow students to ask any questions they have | 10 mins |

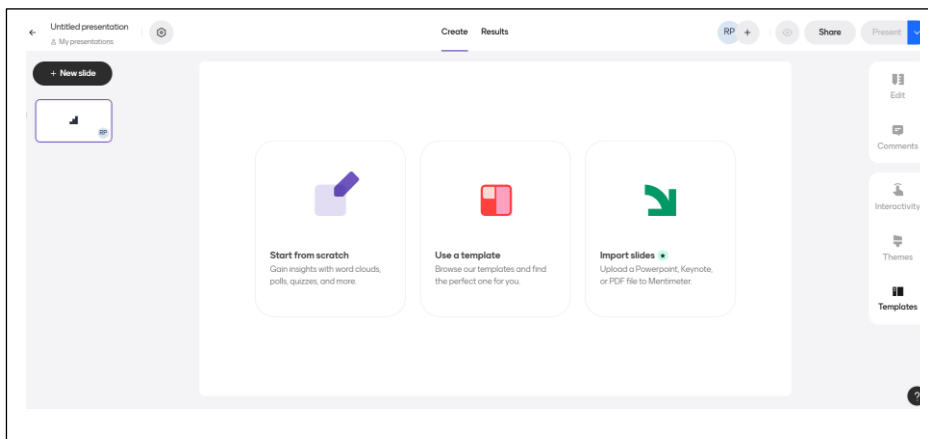
**Assessment Strategies: when and how are they included within the lesson?**

Feeding back their findings to the group from the task.

**Informal reflection (to be completed after the session)**

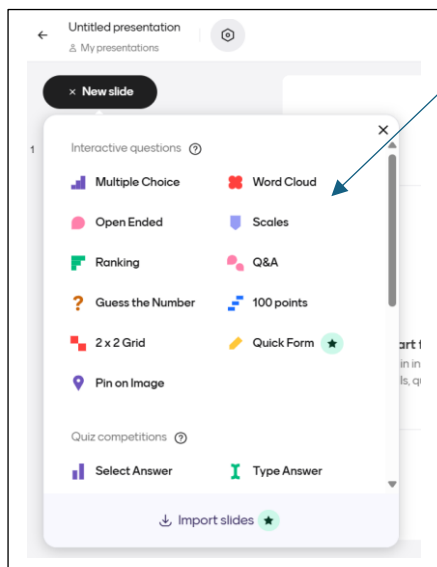
Struggled with the session because it was online, struggled to get the students to engage in the session. Very few were willing to put the cameras on. When the students were put into breakout rooms there was more engagement between each other and with me when I dropped into the breakout room.

## Mentimeter

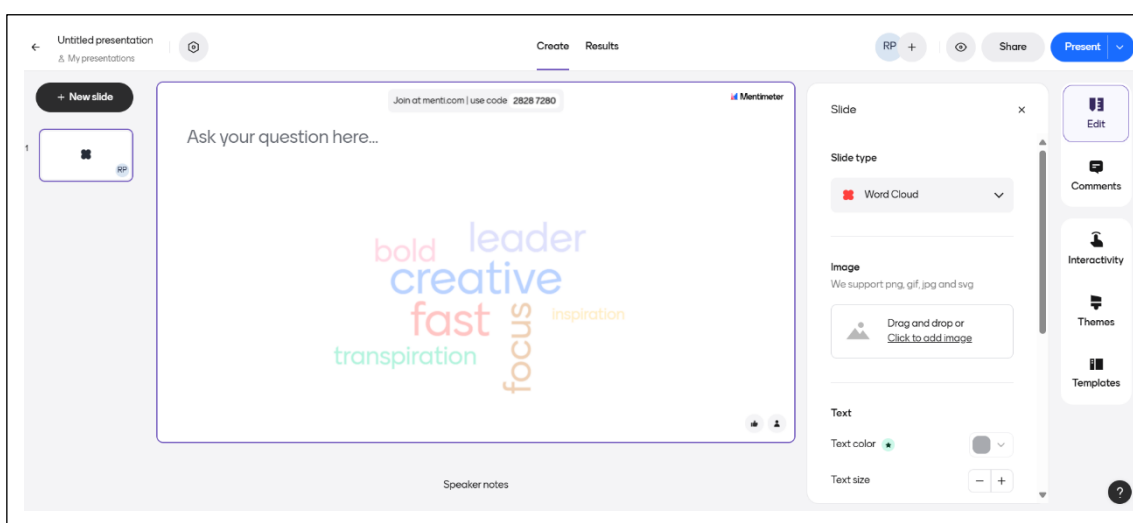


The opening screen on Mentimeter gives you the option to make your own presentation or to use a template of theirs. This allows you to

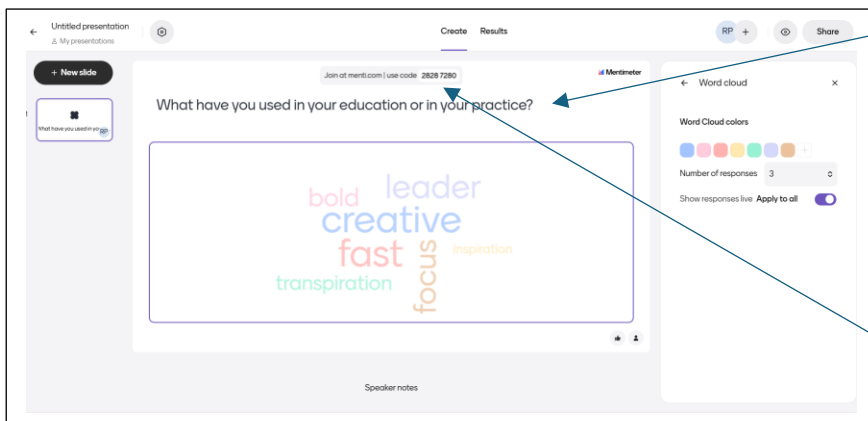
tailor the presentation to suit your needs and the needs of the learners.



When starting from scratch, you are then given the options of what you would like to do. For the purpose of this lesson, I chose to use a word cloud as it encourages collaboration in the classroom and allows the students to share their answers anonymously. By doing this, some students may be more confident in giving their answer.



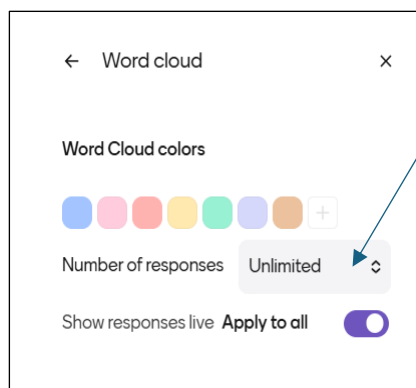
When you choose to use the word cloud feature you are taken to this page.



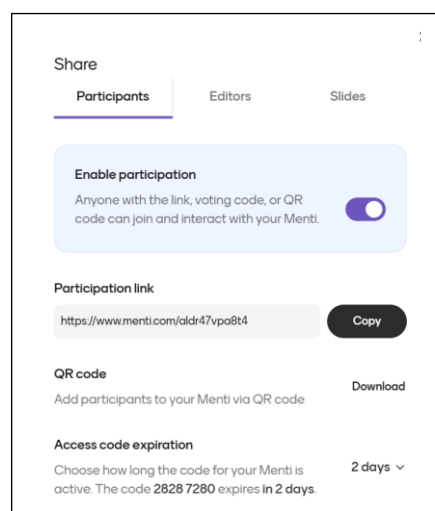
You are then able to display the question or statement that you wish for the students to collaborate with

At the top of the slide, it displays the access code for others to join if they

cannot join by using the QR code, this is also useful if a student is late to join in the activity as they can join in without any disruption to the other students.



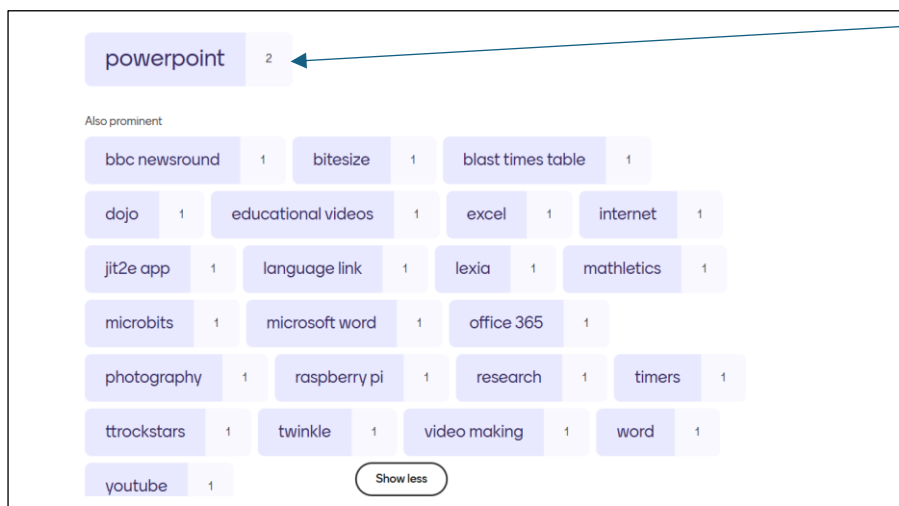
Mentimeter gives you the option to limit the number of answers the students can give per question. For this example, the number of answers was set to unlimited to allow for the students to put as many examples as they have had experience with.



With Mentimeter you are given the option of different methods that you can use for sharing the link to the activity, these include a participation link and a QR code. You are also given the option of how long the link is accessible for by using the link.

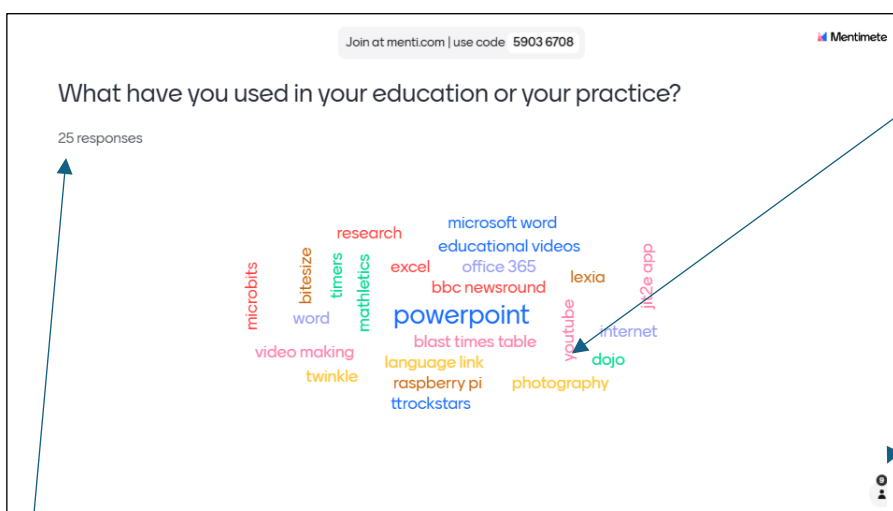


The QR code allows the link to the Mentimeter to be shared easily with the group of students. They are able to scan the code on a digital device and be taken straight to the activity rather than having to go to the website and access the activity through the code. Although this method is an option, the use of the QR code is the quicker and easier method.



Mentimeter allows for the educator to see how many students have given each answer, but it does not tell you who, allowing for anonymity. At this point I am also able to remove any

answers that are not suitable from the word cloud if there were any.



The words are displayed on a word cloud, the larger the word then the more people gave the same answer.

The number in the corner indicates to the presenter how many students have participated in the activity, allowing the teacher to see if the students need more time to complete the activity.

The word cloud shows how many responses you have had in total.

## Conclusion

The use of digital technology is now a part of everyday life in the education sector and the use of it can be enjoyable for both the students and the educators, however it does come with its own challenges. The session above was a very digitally involved lesson, with it being via remote learning over Microsoft Teams. The first challenge faced was that some of the students could not access the Teams meeting via the link and so needed to be 'called in' to the meeting to join, even then one of the students was unable to join straight away due to technical difficulties. The use of remote learning is supported in the Digital 2030 framework (Welsh Government, 2019) as it offers the learners greater opportunity for flexibility and accessibility, which the Welsh Government believe will help retain students in education for longer. This could be seen as a positive step for those learners who require a more flexible approach to learning in the post sixteen sector, however the use of online learning can lead to less engagement from the students in the session as they have fed back to me that they do not like talking as they feel like they are speaking over each other and cannot pick up on social cues online like you can in person. After the session when gaining feedback from the students, some reported that they left the session running on the computer and were completing other tasks around the home or work setting that they were working in. This would imply that the students are not fully engaging in the lessons and so are not getting the full benefits of being in the session and participating.

The use of activities and sharing knowledge and experience is one possible way to keep the students engaged in the session. This worked particularly well by using the word cloud as each student was able to share ideas without speaking over each other, these ideas could then be addressed one by one, allowing for the students to learn from each other as well as from the lecturer. For example, from the results of the word cloud some students who were based in Welsh medium education were able to share the digital tools that they use to support the children and the lessons through the Welsh language, this supports the professional standard "Understand the importance of the Welsh culture and language as a bilingual nation" (Welsh Government, 2017).

Aim two of the Digital 2030 framework for Wales (2019) states that "Learning is enhanced through the use of technology, wherever it is appropriate and beneficial to the learner" (Welsh Government). In this session it could be suggested that the use of different digital resources was used to enhance the engagement and interactivity of the session. Without the use of these collaborative activities then the lecture would be based around directly giving information, which the students have fed back that they do not enjoy or engage with. By giving the students tasks to look at their own experiences and to take responsibility for their own learning it is meeting the professional standard "Enable learners to share responsibility for their own learning and assessment" (Welsh Government, 2017) as well as "Critically reflect on own values, knowledge and skills to improve learning" (Welsh Government, 2017) as they

are reflecting on their own professional practice and feeding information back to their peers.

When looking at the use of technology and digital tools in the education sector it is clear that it can enhance the learning experience for students and allow for learning to be more flexible in its delivery, for example blended learning, and asynchronous learning activities, however there are some drawbacks to the overuse of technology in education. The biggest challenge found was the reliability of the technology, for some students accessing the online sessions was a challenge and for the educators, if the digital activity is not working then it may mean that the lesson is unable to carry on as planned.

Another challenge faced is caused by digital deprivation and how that can affect students. From my observations and experience I have seen the use of QR codes and the need for a second device, for example a smart phone in order to complete an activity. When planning for activities, the teacher cannot assume that all students have access to multiple devices to use in activities, and if the student does not have access ensure that they are able to access the activity through a different means.

There are many positives to the use of technology in the classroom, as shown in the activity for example through the use of sharing ideas and collaborative working. It is also a more sustainable means of which to share information as the students are not requiring printed information, therefore also making it more cost effective but the use of technology must not overshadow the importance of face-to-face communication and collaboration. When used effectively the use of digital technology can offer the students an enjoyable and engaging learning experience that will help them to build the skills, they will need for their future employment.

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