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Reflections on teaching Design and Technology in a pandemic

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Introduction

This article is a reflection on teaching by two teachers, Deborah Winn and Daniela Schillaci-Rowland, in different schools during the global pandemic of 2020/21. Deborah's school is a rural school of approximately 1500 11- 18 year old students. The school has a reasonably high percentage of disadvantaged students and students with vocational rather than academic aspirations. Daniela's school is a smaller all girls school with approximately 1000 11-18 year old more academically minded students on roll. There are many similarities but also some differences to the experiences, which is likely to be the situation worldwide. It seems that few schools were able to respond in the same way due to the number of students isolating, differences in time the schools were closed, parent buy in, access to computers and resources, etc.

The difficulties encountered by teachers, particularly in practical subjects, cannot be underestimated. When Deborah reflected on what it was like to teach in this time an image immediately came to mind of the rope bridge scene in Jumanji - the next level, where the characters are running across rickety bridges in the air that keep moving while being chased by psychotic monkeys. At first teachers weren't sure what they needed to achieve or how long they needed to continue for but they knew they needed to get there quickly. Rules and advice were constantly changing and multiple people, from examination boards, school hierarchy and parents, all wanted our intentions documented in detail. On deeper reflection however, students and teachers adapted quickly to a new way of working and whilst it was a stressful challenge, there were a number of positives that have come out of teaching in this period.

Not least was the rather monumental achievement made when Design Technology departments across England rose up like a small army in response to a need for personal protection equipment (PPE) by key workers in the first 'lock down'. This focused mainly on full face visors and mask clips. Collectively teachers produced and distributed over 650,000 pieces of PPE very rapidly. It is difficult to know how many were made as not all schools said how many they had produced, but the figures were impressive.

Other positives caused a reflection on current practice which required more creative approach es to teaching. Some of these are likely to, or at least should, continue beyond the pandemic.

Unprecedented times!

Whatever the experiences, it is likely that the moment teachers found out that everything had changed will stay with them forever. Daniela reminisces that growing up, she was fascinated by the stories people would tell when recalling events in history, and how they felt at the time and the specific things they could remember. In future generations, Covid will be spoken about in schools and stories passed down generations in the same way.

Daniela remembers that at 5.11pm, Wednesday 18th March 2020, she was standing next to the computers in her classroom, talking to her Design and Technology examination group students about finalising their design portfolios. A student announced “Breaking News, exams have been cancelled!”. A brief moment of silence followed. Then a student asked “Miss, what shall we do?”. What else would a Design and Technology teacher advise two days before the final examination submission deadline? “Carry on, we need to get the portfolios completed!”. For the next two days, school leavers’ assemblies were organised, lockers were emptied, and goodbyes were said, with us not really knowing whether we would be back in school in a few weeks, months or longer. During April 2020 it became apparent that we would not be going back into the classroom before June 2020 at the earliest, but that we should try to ensure students had a good offering of Design and Technology, and to try and keep things as close to ‘normal’ as possible. By the beginning of June, some students were able to be back in school, which meant that the introduction of the design portfolio was in-line with previous examination year groups at least.

For Deborah, the school had already shut the previous week and she recalls, “we had been called to a whole school meeting at the end of the day and fully expected to be told to be prepared for school closures. We dismissed our students and headed for the meeting where we were told we were shut as of this moment. Students would not be returning for at least two weeks but expect more”. In reality the students did not return to the school for face to face teaching for nearly six months. There were no goodbyes for the final year students and work and belongings were left where they sat at the end of that day like in a ghost town. It was a shock to say the least.

Digital learning & teaching

The ‘what next’ happened quickly, the pandemic jettisoned even the most reluctant teachers and students into fully exploiting the opportunities for using digital technologies for teaching and learning but also for meetings, parent’s evenings and training. For in-service training this reduced the cost, the need to travel and the need to be out of school all day. Materials could be easily shared, facial expressions were still able to be seen, unlike in a phone call, and as many videoed meetings it was possible to revisit and clarify points made. Even when life returns to normal it is likely more training and some meetings will be available in this way as people have become used to this way of working, making it more easily accessible to a greater number of people. For teaching the experiences of both students and staff are mixed however, for Design and Technology teachers the ‘bread and butter’, so to speak, is built around a subject where they barely sit down during the day, the world in which we embarked was not one that could easily be adapted to.

During March to July 2020 some schools were able to move lessons online fairly seamlessly. Daniela reports that without lack of computers at home being a barrier the transition, though not without its complications, had been reasonably successful. Schemes of Learning were adapted slightly for 11-14 year olds, to ensure that testing and evaluation of the termly projects were completed. For the examination years luckily they were beginning new topics that were more theory based, preparing them for the start of their design projects, so this seemed a little easier to prepare. Ironically, a year earlier, Daniela’s school had begun the process of creating and using an online learning platform, mainly to be used for homework. Google Classroom,

seemed to give a headstart on some other schools with regards to virtual learning, which meant that work was set, marked and fed back on weekly. Not seeing students or being able to discuss how to improve their work was difficult, but manageable. Deborah's school experienced far greater difficulties. Not all students had a computer, parents working from home or multiple siblings needing the computer meant that some struggled to access the work. It was not a level playing field for individual students or schools.

The Lockdown in January 2021 took many by surprise, however teachers had seen the dwindling numbers of students in school, with some schools reporting whole year groups having to isolate. This period of online learning felt different to the first. With the barriers largely removed many of the schools moved to complete online learning. The experiences of the schools again differed. Daniela reported that student engagement did not appear to be as good as the previous lockdown, and many schools were in limbo with mock examinations - whether to continue with them online or to cancel them. However for Deborah teaching, for all intents and purposes, remained as normal as possible in her school, which was a contrast to the previous lockdown. Surprisingly a number of students produced better work than they had when at school. The reasons for this are unclear, possibly due to lack of distractions - students were not able to go out and had no one to chat to so could be otherwise bored. Possibly it gave students some structure and purpose to their day that could otherwise be lacking. Some students obviously still struggled, home life and the resulting stresses from the pandemic were varied as were student responses but largely the move to online teaching was successful for a larger number of students. Both Daniela and Deborah agree this was however no substitute for face to face learning.

Some of the difficulties to online teaching were creating appropriate resources. Unlike in a classroom it wasn't possible to walk around and check understanding and progress therefore direction needed to be more explicit. Teachers also needed to be mindful that some students were accessing the lessons on their phones so may not see detail clearly or may not be able to flip screens as easily or complete computer based tasks. Differentiation was also complicated by needing to keep the direction on screen to a minimum. Strategies like requesting that students gave a thumbs up or thumbs down reaction to gauge understanding or to maintain engagement were helpful but no substitute for physically being able to see their work. More additional technologies than before were used like visualisers or self-made video clips to aid demonstrating tasks like drawing. These have been very useful and teachers are likely to continue using these methods. Other elements of online platforms like 'Teams' and 'Google Classroom', such as the class files and assignments features, may also stay as it is easier to track work and respond to students through this.

Both of the schools, once comfortable with this way of working, started to use the platform for wider benefits. In Deborah's school, Catering teachers offered 'family cook alongs' in the evenings. At the allotted time one teacher demonstrated the cooking method and the other fielded questions and indicated pace to the one demonstrating. At its peak, 107 students and their families joined. Daniela also stated she felt incredibly lucky to be part of a department (and school) where pupil engagement was good, and at times, it felt like things carried on as normal in their 'bubble'. Textiles students worked hard on their entries for *The Young Designer of the Year* (a national competition); Food, Preparation and Nutrition students had their weekly Cook-a-longs; and Product Design students were busy working on their projects, such as the

eco-speaker, confectionery packaging, and in the sixth form (17-18 year olds), on their architectural models. For Daniela this had a really positive impact on her own wellbeing, knowing that students were 'hanging in there'. Activities such as these in both schools promoted Design and Technology, community spirit and provided a break from the potentially monotonous routine of online learning, potentially improving the students' wellbeing and highlighting the 'above and beyond' attitude of Design and Technology teachers and scope of the subject.

Both schools report that whilst elated to be back in school they believed the students (and staff) had done incredibly well and were extremely proud of the way they had utilised online learning in the most positive way.

A note of caution going forward however is that the lines between home and work become blurred. This is sometimes helpful as the ability to work from home creates a better home, work balance but other times it can create the expectation that you are always available and boundaries need to be set.

Creative teaching

Once back in school in September 2020 and then again in March 2021 students were contained in 'bubbles' to aid safety along with other measures such as wearing masks and social distancing. In Deborah's school this meant that each year group was allocated an area of the school with the intention that if segregated a single year group bubble could be sent home to isolate rather than the whole school, should a number of Covid cases occur. Therefore, for most, teaching and learning wouldn't be disrupted. Daniela's school also had a bubble system but could mainly carry on as normal apart from with practical work. Both online learning and bubbles created unique problems for practical subjects like Design and Technology that required creative solutions.

Deborah reported that Design Technology provided the opportunity to break from the standard routine they had of logging on and completing a task at the computer for five to six hours straight. For example, one task set a treasure hunt asking students to find plastic items around the home and then analyse them. As the school is in a rural area another asked students to go into their gardens to take photos as research for design tasks. Others were making tasks, again mindful that some students lacked resources, even as simple as coloured pencils, so a variety of responses were allowed.

The making tasks were quite thought provoking to Deborah in that lessons had previously followed a rigid structure to ensure skills were achieved and to aid assessment. Whilst they included an element of creativity, essentially they were asking students to make identical products that demonstrated a particular focus or skill. She became aware that in meeting the objectives and assessment criteria a lot of the creativity had been stamped out of the subject. It is obviously important to ensure skills are achieved, but the results from being more open were interesting. For instance, an architecture project allowed a variety of responses including Minecraft as well as hand drawn and modelling from whatever students could find to complete it. The task gained a high level of engagement and enthusiastic responses. As Deborah's school considers next years' lesson planning an open ended task that can be completed in the students preferred way will certainly be part of it.

Teaching in bubbles caused different problems. Restrictions meant that group work and practical lessons were generally off limits. Safety guidance meant we could ensure that students were still able to learn subject knowledge, but practical work was difficult. Not easy when a significant amount of the subject involves practical work. For exam years in particular, research was well underway, with the impending development and modelling stage almost upon them, where they would want to use tools and equipment to explore possible solutions to their design ideas. Although many of the national examination boards later removed the practical element from the requirements, it brought with it complications in how do you judge the practical ability of a student when you can't make anything. Deborah's school continued in a limited way with practical tasks as these were vocational rather than academic qualifications and the practical tasks hadn't been removed from the requirements. It brought with it a whole host of difficulties. What practical tasks could and couldn't be completed in a maths classroom? Can resources fit on a trolley? How is equipment going to be sanitised between bubbles? How are you going to get equipment to the classroom as you might be running from one side of the school to the other whilst the students only have to move a few metres. Mostly more specialist tasks needed to be put on hold as even if the year group was in a workshop many rules needed adhering to. It wasn't impossible, just very difficult as it all took additional time and preparation. We also needed to mindful that some students were fearful of being in school and a more active environment made their anxiety worse. For Daniela the return in March 2021 brought with it an easing of practical restrictions, reflecting that she was 'delighted that practical was able to recommence, giving a little more of our subject identity back. "The sound of the drill, the noise of the laser cutter and the musical tone of the 3D printer setting up was so good to hear". In Deborah's school the disparity in experiences continues as the restrictions remained in place, with possible talk of a return to practical spaces in the final six weeks of the school year at the earliest. The differences also continue for individual students and staff as some are sent home to isolate and need to switch between online and face to face learning quickly. Daniela reports that 'being a mother of three primary school aged children was also a challenge (as well as having a husband who is a senior leader) as two of them had to isolate due to positive cases in their bubbles. Daniela was more lucky as her school were so supportive, and allowed her to teach lessons from home, virtually, to the students in school. This actually worked really well, and she will be forever grateful to the amazing cover supervisors who also helped manage things back in the classroom.'

Public Examinations

One of the most challenging aspects of teaching in the pandemic has been managing examination grading. Guidance from the government and examination boards was updated often and when, as Design and Technology departments in schools often do, they deal with a few different boards managing this information takes considerable time. However, making sure gradings were fair was another sizable challenge. The experience for students has been varied, some have had to stay home for shielding, others have not. Some have not coped well with the emotional side of the times we are in, others have. Some of the exam boards removed the practical elements, others have not. On the one hand this was necessary as practical work wasn't possible for the reasons above. On the other hand it has been important not to disadvantage the students who would have normally fared better in the practical element. This aspect was especially challenging as the exam boards have insisted that physical evidence is available to justify grades given if they ask for it. How to demonstrate the student's practical

ability without being able to make a product has been difficult to say the least. There was a move to teacher assessed grades and the way it has been done has brought with is a considerable amount of responsibility and stress. Deciding and collecting evidence for the given grades, along with the associated paperwork to ensure their validity and reliability has been exhausting.

Conclusions

It is undeniable that teaching in the pandemic has been extremely difficult and an experience that we doubt anyone would want to go through again but there have been positive elements. Networking for training and other purposes, between teachers and with the community has become easier as people have got to grips with video conferencing. Increased input from local business and external experts as the demands on their time has been reduced by not having to visit is certainly beneficial. Being able to open up enrichment opportunities for students and families that might not otherwise be able to, creates a good rapport between teachers, students and their families.

A chance to reflect on what and how we teach in the classroom has meant that some have changed their practices with a renewed focus on creativity and the opportunities offered to students.

Many talk about how this generation will be at such a disadvantage, and they have huge gaps of knowledge. However, there is a different side, in that this generation will be stronger in other ways; they will be more resilient, will be able to handle situations independently, learn to be happy in their own company, spend more time at home, and be better equipped for constant change.

There are hurdles that still need to be overcome, this game of Jumanji isn't over yet. There are significant gaps in the students learning but teachers know what they are and what they have to do to fill them, exam boards are likely to make changes to their requirements for at least the next year and the virus hasn't gone away. There is always the concern of another wave and another lockdown but teachers know they can survive it and they know how to support the students so the future, whatever it may bring, is more positive than before.