

SCIENCE PLAYTIME

Mike Wride



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*"It is the very nature of play that nothing is taken for granted as being absolutely unalterable and that its outcomes and conclusions cannot be known beforehand."*¹

*"Any search for absolute, fixed knowledge is illusory since all knowledge arises out of the shifting, changing activity of creative perception, free play, unfoldment into action and its return into experience."*¹

A cold Friday in December in Dublin...as it often is, the wind is biting, blowing in from the North East off the Irish Sea, across Dublin Bay and up the River Liffey. Blustering its busy way between the buildings of Trinity College. It's 9:45 am. I'm heading towards the old Botany lecture theatre-a very traditional space...wooden benches for seats that seem to trap the history here within them. How many lecturers' words have fallen on sleepy students' deaf ears in this place?

So, I'm mulling things over in my head as I shuffle along against the wind: What is it I want to achieve today? The truth is I'm panickingslightly! As far as I'm concerned the wind can blow as hard as it likes if it pushes me away....What on earth have I let myself in for? Was this whole idea of having the students do creative presentations today a mad one? What if they don't engage with this at all? What if it's just a total shambles? Why oh why did I ever come up with this idea?

A couple of weeks ago, I'd had a tutorial with these Functional Biology and Plant Science students on Problem Solving and Creativity in Science. It seemed to go well enough....Now they have to present the results of their research on a creative breakthrough in science and/or a creative scientist - on any subject of their choice. But they have to do it creatively in groups!

"People have an interesting response to being creative or 'playing'. I think it is very healthy and it has opened my eyes to the fact that not all of the best work is done staring at a computer screen."

Student Reflection

We had started by playing with juggling balls in my first class with them in their third year. They're expecting some serious science and what do they get?juggling! Not quite what they expected! After the initial shock, they begin to drop their rigid preconceptions... "Come on, let's juggle!" I say... "No, we can't juggle!" they say! "Yes, you can!" I say! ... "It's behind yooooouuuu"! They gradually begin to engage with this 'madman'. They begin to let go of some of the protective methods they've set up previously in the anonymous classes of 200 plus science students lumped together in Freshman Science. Now they start to engage with their peers, they're getting to know each other. It's a relatively small group, which helps.

There are still some shy ones who don't participate, but even they're smiling.... There is a lightness developing. There is laughter. We try individual juggling and good old-fashioned ball throwing (one or two said they hadn't thrown a ball for years, since they were children!). Now there's a circle in the seminar room with everyone throwing and catching the balls...one ball, then two, then three! Patterns emerge and decay, we discuss chaos, complexity, emergence, the idea of flow...of what it is to play and have fun again. It's certainly not biology - maybe a bit of physics, but it helps bond them definitely.



But, but, but....that's history now. I've had a few sessions with them since then - discussing ethics and some philosophy of science...developing some more playful and creative ways of thinking I hope and more group work too.

But, but, but...what about these creativity presentations today? Well, it's the first time I've ever done anything like this....

I always viewed science as creative, working in the laboratory or reading - discovering new things and making novel connections between them. But, I'd become disillusioned with the pouring of the fixed, text-book 'facts' into the 'empty vessels' of the passive students. I'd concluded that we should move in a new direction in which greater freedom for the 'play of thought' is permitted¹. I'd decided science teaching needed to be more playful and less rigid - to harmonise playfulness, ideas and creativity². I'd discovered that Vygotsky described play as "imagination in action" - the creative process develops in play as new and unfamiliar meanings emerge³. There seemed to me that a narrowness of vision had developed in science, owing to specialisation and fragmentation. I felt that science and science education had lost the wider view of science as a creative, flexible and dynamic process rather than something rigid and fixed - there can be no creativity in rigidity. But, how would I learn about how I might practically alter this view?

So, I enrolled in the MEd course in Higher Education Teaching and Learning part time through the School of Education at Trinity and had been taking this during the previous two years. I had developed an interest in creativity in science education in the first module. I had always had interests in art and writing. I now felt inspired to explore this area further in the research for my MEd dissertation on 'Re-creating Science in Higher Education'. I began looking at this from a philosophical perspective of nature and science itself as dynamic and inherently creative processes.

During one MEd evening, we were asked to present a 'micro-teaching' session and my colleagues said.... "Well, it's obvious, you have to get the students to present science in a creative way if you're going to teach them about creativity in science". "Doh! Why didn't I think of that?"...Locked in my own dogmas I guess.

So, this was the first step - to go beyond my own risk aversion to try something creative and different with my students - to open up possibilities, rather than close them down with 'facts'. To help make science live again, for both me and for my students.

Anyway, a little (new) knowledge is a dangerous thing.....etc etc And I could always blame my colleagues if this all went horribly wrong...

Ok, here goes....I turn the corner and.... "Hmmm! This is unusual."...several students standing outside wearing lab coats and goggles...engaged in animated conversations....a muffled "Good morning." from me as I walk by them and enter the doorway to the old building... they hardly acknowledge me, they're so wrapped up in whatever it is they're discussing.

I pass the stern (mostly) faces of the past Chairs of Botany who hang in their golden frames on the wall as I climb the stairs. I feel their silent eyes judging me from the past. "Play has no place in the serious and earnest business of learning the facts and truths of science young man! You should know better!" There's an audible din, a cacophony of student voices (certainly not from the massed Chairs of Botany), which get louder as I get closer to the door of the old theatre...this is definitely not the norm!

I'm expecting the usual placid and passive faces, butdeep breath...and through the threshold!....There are various groups scattered around, animated, active and loud conversations, gesticulation, laughter... I realise that there are four girls in the corner dressed as old ladies, with sticks and purposely bent backs... I hear the word Viagra...Ah, I see, it's a play about the discovery and development of Viagra!... Over there, another group of young woman all wearing moustaches and lab coats, Nobody's noticed me yet.... I'm standing behind the lectern just surveying the scene. This is (not very) organized chaos...To my right, a group is blowing up balloons, there is a tray full of rice crispy squares (something about GM rice), another group is putting the final touches to a cardboard cut-out model of what looks to be (with some artistic license built in) a DNA molecule! Another group is rapidly going over a flip chart with some beautiful art work - wonderful illustrated figuresthat looks like Darwin, that looks like Wallace!

OK, so we're off....let the presentations begin!... No power points please....there's a silent, sepia-toned movie of Marie Curie written, directed and starred in by the students. Brilliant!!!! Black and white with 'plonky' 1920s piano music and lots of humour...

One after the other the groups of 3-4 students perform...and, and, and...they love it!!! One and all, they've engaged with it, the process, the science and scientists and each other and I'm loving it too. I'm still trying to grade...to think about the scientific content, but also to acknowledge the extent of their creativity...Bless them, the Viagra girls' play was hilarious - everyone in stitches with laughter, but sadly there could have been a bit more science...they admitted this later when they reflected on it all. The chemistry Who Wants to be a Millionaire Quiz was great - loads of audience participation. The lads who brought the real horse's heart in to talk about William Harvey, discoverer of the blood circulation, excelled themselves! Now, there's a puppet shownow a day time TV interview show 'Cultured' - with one of the students acting the part of Lynn Margulis, who came up with the endosymbiotic theory.

Phew, I think it worked....A couple of hours later, it's all done... and the old theatre, to be fair, has had a bit of a makeover....balloons and party popper streamers strewn around the place...plenty of chocolate flavoured errant rice crispies now decorating the old benches. The DNA model now on the bookshelf on the far side sadly no longer upright and proud, but now more like the leaning tower of Pizza!

I have to make my apologies and depart - another lecture to giveAs I leave the theatre, the laughter and noise continues, but gradually fades behind me. Well, what a relief...now I just need to assess the assignment, consisting of the science as well as a reflection of each student on the process of engaging in this experiment....I guess the risk was worth it! Science playtime was fun!

I felt re-invigorated about science as a playful and creative activity and about the potential for science students to embody this! I realised that they're crying out for more creative ways of learning. I also felt like I had evolved in the process. I had overcome my own fears to try something new and take a risk! And I had thoroughly enjoyed it. The Botany lecture theatre had certainly been livened up a bit and perhaps the Chairs of Botany, fixed in place in their frames on the stairwell, might approve after all ...maybe!

URLs

Student Movies

<http://functionalbiologytcd.blogspot.ie/2015/01/cultured-lynn-margulis.html>

<http://functionalbiologytcd.blogspot.ie/2013/12/marie-curie-and-radioactivity-silent.html>

MEd Dissertation:

https://www.academia.edu/11508366/_Re-Creating_Science_in_Higher_Education_Exploring_a_Creativity_Philosophy

References

- 1 Bohm, D., & Peat, F.D. (2000). Science, order, and creativity (2nd ed.). London: Routledge.
- 2 Bateson, P., & Nettle, D. (2014). Playfulness, ideas and creativity: a survey. Creativity Research Journal, 26(2), 219-222.
- 3 Lindqvist, G. (2003). Vygotsky's theory of creativity. Creativity Research Journal, 15(2), 245-251.

