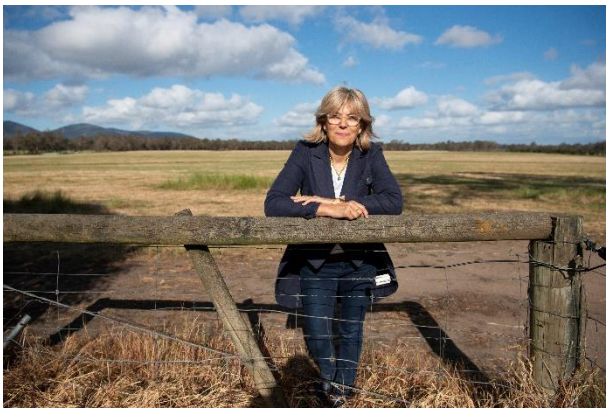
Learning from a pioneer in the field of imagination in play and imagination in STEM

By: Maria Grindheim

Marilyn Fleer is a professor II at the KINDknow Centre in Western Norway University of Applied Sciences. She holds the Foundation Chair in *Early Childhood Education and Development* at Monash University in Australia, where she is also a **Kathleen Fitzpatrick Australian Laureate Fellow.** Additionally, she holds the positions of an honorary Research Fellow in the Department of Education, University of Oxford, and has been bestowed the title of Honorary professor at the Danish School of Education, Aarhus University, Denmark. We have had the honour of getting to know her better through a feature interview.

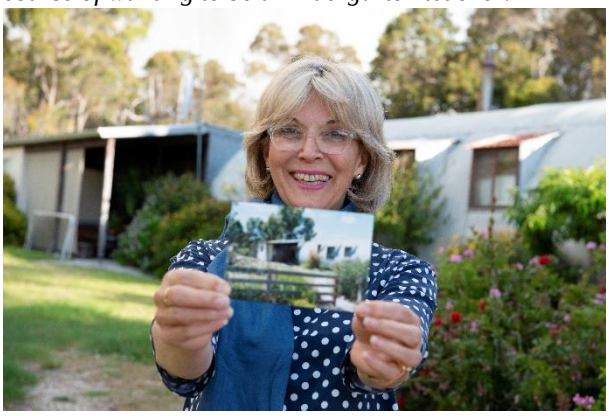


Marilyn Fleer is the director of Conceptual PlayLab

Fleer researches in the areas of early childhood science, engineering, and technologies with particular attention on digital visual methodology framed through cultural-historical theory. She is director of the Conceptual PlayLab at Monash University in Australia investigating "Imagination in play and imagination in STEM[1]." The Conceptual PlayLab investigates how families and teachers create conditions for children`s conceptual thinking in play-based settings. She was awarded the 2018 Kathleen Fitzpatrick Laureate Fellowship by the Australian Research Council and is a former President of the International Society of Cultural-historical Activity Research (ISCAR). Fleer held numerous Government appointed advisory positions related to the development of quality early childhood education provision. She was presented with the *2019 Ashley Goldsworthy Award* for Outstanding leadership in university-business collaborations. In the following we learn about Fleers` way into early childhood education (ECE) and what she thinks about the challenges in the field today.

What is your background and what made you interested in early childhood education?

So, I guess the story started when I was growing up - as a child not really knowing what I wanted to do in my career. I had this moment as a teenager where the school organized a placement visit - you know a workplace visit to support teenagers think about "the real work") - what transpired out of that was a small group of us being sent to a local kindergarten. In that kindergarten I watched groups of children, some of whom were playing with blocks and other children were outside with their pitchers of wood cutting and hammering and sawing and so on. The kindergarten teacher asked us to go and observe, and when we came back, she asked what had we noticed? She was a very good pedagogue; instead of telling us about kindergarten she got us to experience it and then she asked us what we had noticed. I commented how I had watched children counting blocks and thought it was rather odd that they would point to an object and go "1-2-3-4" point to the next object and go "5-6-7" and then point to the next object and go "8-9-10"- counting to 10 pointing to only three objects. She then told me all about the thinking of the child in learning mathematical concepts and I was just so excited, engaged and hooked at that moment. This made me think "wow, these young children have these amazing minds" and that being at the kindergarten must be so exciting. That set me on the course of wanting to be a kindergarten teacher.

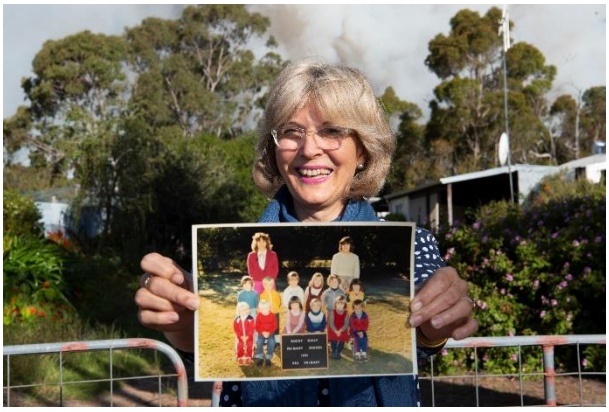


Fleer´s first kindergarten teaching position in a hut in the country

[1] Science, technology, engineering and mathematics

I went to university to study kindergarten teaching. In my final year we had a big internship, a placement where you start by observing and then eventually you take full control. At the end somebody comes out, assesses you and says "yes, you can be an independent kindergarten teacher." I then went back to that kindergarten teacher, in that kindergarten in that small town and asked if I could do my placement there.

So, it was a beautiful circle back. The kindergarten teacher was very happy to help me and she was outstanding - as you can hear from the example of how she engaged with us when we were teenagers. Both as a young adult and as a freshly educated kindergarten teacher she taught me so much. That was very exciting for me and the beginning of my career.



Fleer visiting the kindergarten 40 years on

What is the funniest thing you have done in your career?

The funniest thing that I remember was when I was a kindergarten teacher, teaching in the Goldfields region (a mining region with goldfields everywhere - a very old town). In my third year of teaching when a "superintendent" (someone who came to visit all the new teachers to make sure they were doing good work), came to see what I was doing. Sometime later he asked if I would like to be part of a regional study looking at transitions of children from kindergarten into school. I then found myself in a team with the superintendent driving through the desert in a big wheel drive going all over the region in the span of one week and staying in different places. For me, the fun part was that: In my kindergarten I had large numbers of aboriginal children, and a part of the cultural practise is for children to travel a lot in the region. So, as I was traveling around going to different communities, I found one of my children in one of the kindergartens somewhere else. For me, that was hugely fun; to see her in another context to the one where I had normally seen her. It was beautiful from the point of view that there was this distributed culture practise for families – to travel and visit places within the region for long periods of time. It was like a beautiful connection. It was fun and funny at the same time.

Which topics have you personally found the most interesting to work with?

I will share a little story with you: I started my research as a kindergarten teacher – every year I set a goal for myself to learn something new. And eventually I decided I would do a PhD (not as a kindergarten teacher but as an early career academic). I grew up with my first language not being English, and we did not have books at home. I therefore found it really difficult to learn to read, so I had a bit of an aversion to anything called literacy. Even when I was studying the pedagogy of reading, I found that I got quite stressed by that. So, I was not interested in doing any research in a humanities area, which was very common for people in my time. I was a bit of abnormally wanting to do research in science, mathematics, or technologies - and that stayed with me all my life. The fun part about that, which I also found really, really interesting was that the everyday world can be interpreted through STEM lenses in so many ways and it has this layer of richness - but in the early days when I would go to a conference, all excited to present my paper, and I had the word science in it the abstract, I would have about three people attend. Even though I was doing science and play at that time, I was such a novice that I did not realize that most of the community was not interested in that topic. I therefore changed how I presented my work and I talked about play which happened to be science and suddenly there would be 30 people in the room – you know, it went from 3 to 30. That was a valuable thing for me to learn, but the topic itself had not changed. Now, the work that I have been doing have continued in this space. The Laureate fellowship that I have is funded through the Australian research

Fleer holds The Laureate fellowship founded by the Australian research council

council[2]. No one else in Australia in ECE has ever received one. Actually, there is only one person who has received one other than me in education – and that was in 2010. It is exciting to have early childhood privileged in this way. Particularly because I continued with my interest in STEM and so the overarching theme of my working is around imagination in play and imagination in STEM.

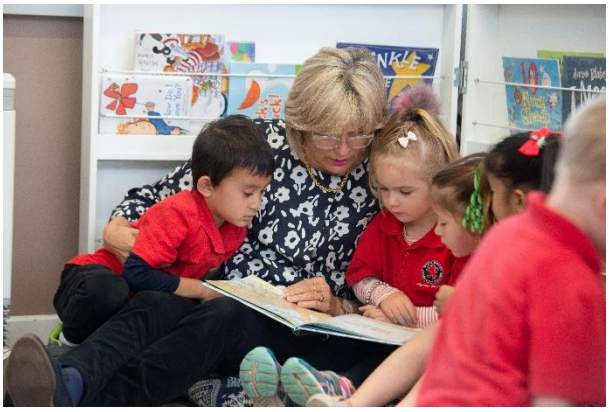
"If you build children's imagination in STEM, you are exploring wonder, creativity, imagining and then you are able to learn about concepts and bring them into your play and thereby play more richly."

I look at how if you build children's capacity in play, you build their capacity to think abstractly. If you build children's imagination in STEM, you are exploring wonder, creativity, imagining and then you are able to learn about concepts and bring them into your play and thereby play more richly. So, it is kind of a dialectic between imagination in STEM and imagination in play. So that is my most fascinating topic that has been with me since I was a kindergarten teacher.

Imagination in play and imagination in STEM

What do you think are the currently most important issues regarding early childhood education?

This depends on what perspective you take. If we look at it loosely geographically, in the northern hemisphere countries there appears to be concern for a push down curriculum, which means making kindergartens more like school. In some countries in North America we are seeing this push to get rid of play because you have got to focus on academic content. So that has been a worry for the last ten year, academization or schoolification of ECE. In the southern hemisphere, loosely, across the Asian pacific region and in South America etc., there have been more formal school education systems, and therefore more formal kindergarten programs where play is scheduled, (i.e. from 10am – 11am and 3pm – 4pm) and the rest is academic learning. What we are seeing in those countries is that governments are saying to early childhood educators that "we want more innovative and creative citizens" and having a formal education for young children does not support that new agenda and we have now put in place play based curriculum and programs. So, we have got this kind of northern hemisphere and southern hemisphere (I am talking very loosely) looking at the relationship between play and learning and this will continue with different societal and cultural perspectives. It will continue to be important for some time yet.



Conceptual PlayWorlds is a game changer

When I graduated, one of the things people worried about was girls opportunities and access to STEM, And so there was a lot of research and a lot of funding that went into programs to make sure girls got opportunities to become engineers, coders, scientist and so on. Then over a period of time this kind of just stopped being researched. This was from the 80`s and into the early 90`s, and then it has just stopped. More recently (because of governments reports) in some countries - I don't know what it is like in Norway, but in USA and Australia - this is a big problem; which is that only a small proportion of girls opt to go into STEM-related fields. There are two big problems here that I see. One is that those fields are not having half the population give their capacity to it, so therefore as a community we are missing out if girls are not given the possibilities and as a community we are poorer for it. Secondly, in the engineering profession in many countries (not all

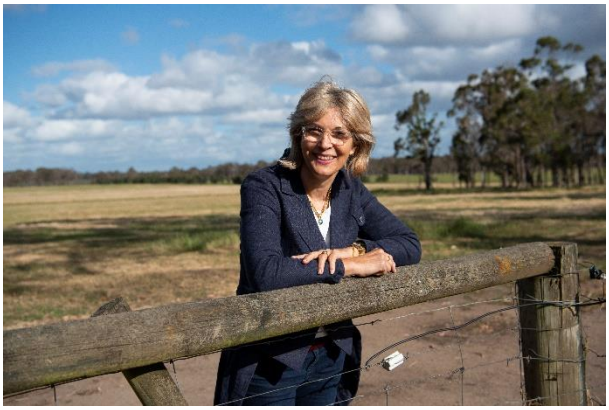
[2] The Laureate fellowship is founded by the Australian research council which is equivalent to the Norwegian research council in its level of prestige

countries, because some countries are doing really well) you are looking at only 12% or 20% of the profession being female. So, it is a worry from that point of view, but it is also a worry for women, because a lot of the well-paid jobs in communities are people who have a STEM background. There is research that shows that they are the best paid.

So, I think that is also a problem for women in the sense of not having the access for a whole range of reasons. In my research, what we are noticing is that all the problems that were identified in the 80`s and 90`s with girls in free play based settings not accessing resources for a range of reasons, are still there. Some of the studies I have seen show that, and our Australian study show that as well.

"...what we are noticing is that all the problems that were identified in the 80`s and 90`s with girls in free play-based sitting, not accessing resources for a range of reasons, are still there"

But we are really excited because our Conceptual PlayWorld model[3], which is a model that brings play and learning together (hence my long-standing research) is showing that when teachers create a conceptual play world they are part of play practices with the children, so if there is a practice from home that is very gendered the teachers see it very easily and they cleverly adjust it. When they are outside of the play, they miss it. We are noticing is that the girls are just as excited about STEM as the boys. And the teachers are doing an amazing job in the play world being able to make sure the girls get access. And any gendered stereo type that might come from the community, the media, from home or wherever the source is, actually goes away. That is a game changer.



We need more girls and women in STEM

[3] Conceptual PlayWorld website
https://www.monash.edu/conceptual-playworld
PlayLab shares practices https://www.facebook.com/marilyn.fleer.14
Educators share their playworlds
https://www.facebook.com/groups/383942372405331/