

# *Exploring the disciplinary connectedness of science*

**Azra Moeed**



# Who am I?

- My first observation in New Zealand....
- People smile when they see a stranger
- More evidence....
- It appears that Most New Zealanders smile
- My inference:
- **New Zealand is a land of smiling people!**

# Second observation...

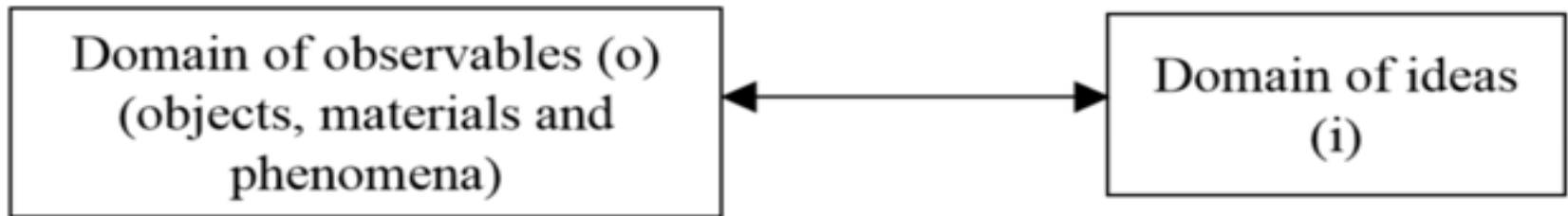
- Everyone notices!
- ... and knows “some science”....
- What has changed? ....
- Not everyone knows science....

# Science Knowledge

- Content knowledge  
*[Science ideas]*
- Procedural Knowledge  
*[Doing science]*
- Knowledge about the Nature of Science  
*[How science works]*

# Beyond play...

# Teaching and learning science



- Practical work linking the two domains (From Abrahams & Millar, 2008, p. 1948)

# What makes a cake rise?



# And now the muffin





# So what makes them rise?

Sodium hydrogen carbonate + Tartaric acid  
→ Sodium tartrate + Carbon dioxide

*This is an acid and carbonate reaction*

Sodium hydrogen carbonate →  
Sodium carbonate + Carbon dioxide

*This is a decomposition reaction*

# Did granny need to know this?

- No, she had the experience and did not have to write an essay or an exam!
- Let's look at another thought....

# Conversation in primary class...

- What do we breathe in?
- Oxygen?
- What do we breathe out?
- Carbon dioxide?
- What about plants...
- What do plants breathe in?
- What do they breathe out?

# Later in secondary school...

Composition of air

78% Nitrogen

21% Oxygen

0.033% Carbon dioxide

Rest a mixture of water vapour, dust...

# Have the students considered ...

- 0.033% Carbon dioxide is responsible for the entire food on this planet!

# Have the students considered ...

- 0.03% Carbon dioxide has not yet reached 0.04% and we are experiencing climate change.

It is predicted that it will reach (0.04% in 2016)

# So what is teaching science really about?

- Is it just learning facts?
- Is it just about doing science?
- Is it about asking questions and being curious?
- For younger children noticing, exploring, asking questions.....
- One way of making learning meaningful... familiar context...

# Lets think about the human body..

- What is the biology in human body?
- What biology we can and do teach?



# What about chemistry?

# What about physics?

# Questions?

- Thank you for inviting me and giving me the opportunity to share my thoughts.

# Hawk Feathers?





# Peacock Feather





# Feather development



# Down Feathers





# Peacock Feather





**What use does  
this feather have?**



# Teaching and Learning Science



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