

# 360-degree video analysis for teaching practice

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# Why 360 degree video

Q: What do you notice about his teaching?



# Why 360 degree video

- Now if we Watch it 360 mode....
  1. What do you notice about teaching?
  2. *What do you notice about learning?*



# Two Approaches

- Part A: What insights can 360degree video analysis give re students learning in mathematics
- Part B: How can reflection on own practice, using 360degree video, inform one's own teaching practice



# **Part A: What insights can 360degree video analysis give re students learning in mathematics**



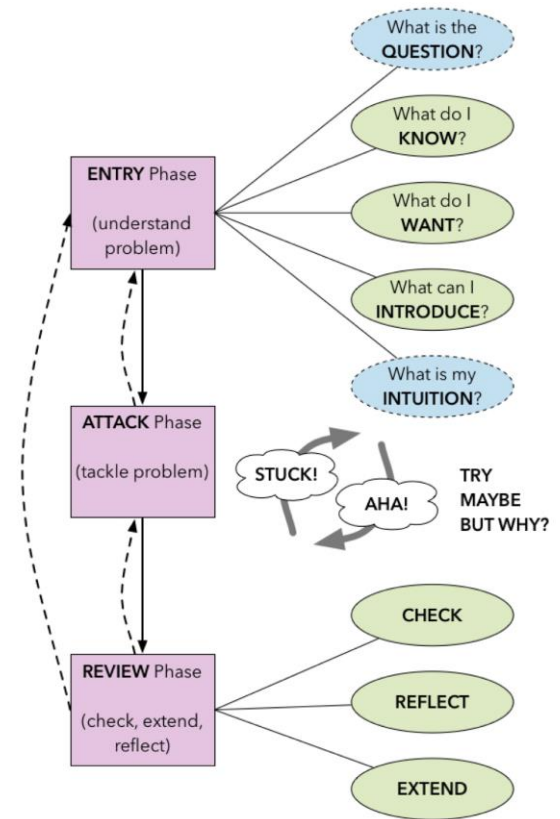
# Part A: Cool Years

- What insights can 360degree video analysis give re students learning in mathematics



# Context: the course

- MATH 1070 is a problem-solving course focussed on developing mathematical thinking, communication, and problem-solving skills in pre-service maths teachers.
- Each workshop is centred around students working together to tackle unfamiliar mathematical problems. Each activity is followed by whole-class discussion to emphasise and draw out key aspects of mathematical thinking and problem solving.



Adapted from: Mason J, Burton L & Stacey K 2010, Thinking mathematically, 2nd ed, Prentice Hall, UK



# The 'Cool Years' Problem

A 'cool year' is one whose individual digits add up to a square number.

For example:

2020 is a cool year because:  
 $2 + 0 + 2 + 0 = 4$   
and 4 is a square number.

1980 is a not cool year because:  
 $1 + 9 + 8 + 0 = 18$   
and 18 is not a square number.

How many cool years are there in the 21<sup>st</sup> century?





# Analysing videos – focus on students

Q: What insights can 360° video give about how students think mathematically?

- Watch the 5 min video 'Cool Years (students)'
- In your groups, discuss what you observed about:
  1. how the students started to think about the problem (ENTRY)
  2. the strategy the students used to tackle the problem (ATTACK)
  3. the way their problem solving / mathematical thinking evolved over time
  4. and anything else you noticed



# Some key moments

2001 ✗

2002 ✓

2003 ✗

2004 ✗

2005 ✗

2006 ✗

2007 ✓

2014 ✗. confusing  $2+14$  with  $2+1+4$

‘take one off the last number and add it to the one in front’ — ‘do every nine years’

2007

2016

2025

2034

2043

2052

2061

2070



# Analysing videos – focus on teacher

Q: What insights can 360° video give about my teaching and its influence on how students think mathematically?

1. Bringing the class together for discussion sometimes interrupts their ‘flow’
2. Students are not necessarily ‘off task’ when I am talking
3. The way you respond to students can influence whether they stop thinking, or continue to ponder for themselves  
‘Is that her saying it’s right? She didn’t say it was right or wrong.’
4. Students interpret your words and actions in ways you might not intend.  
‘I knew that smile meant something!’



# **Part B: How can reflection on own practice, using 360degree video, inform one's own teaching practice**



# What we do with our pre-service teachers:

## Part of assessment (2022)

- The PSTs, in assigned groups, are required (as part of normal course work) to prepare a teaching presentation for their peers on a particular aspect of mathematics.
- Each student plans and teaches an aspect of a lesson (~4-5 mins) to their peers. This is done in the first half of the course. [attempt 1]
- Each student is paired with another student to co-plan a lesson. They then teach an aspect of the lesson at same time but to separate groups of peers (in different rooms). [attempt 2]
- The presentations are recorded using 360-degree cameras, the video files were converted to the appropriate format and shared with the pre-service teachers. Initially just their own video, then after their reflection they reflect on the other partner's video.

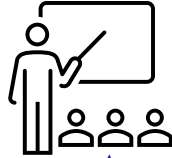


# Part 1 (first half of course)

Plan



Teach

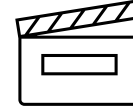


*Record using  
360 video*

Reflect

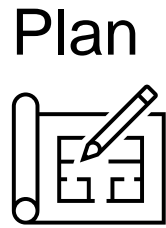


*Review own  
360 video*

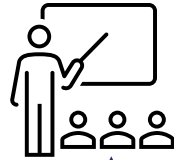


Reflect

# Part 2 (second half of course)



Teach



*Record using  
360 video*

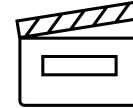
Reflect



Reflect



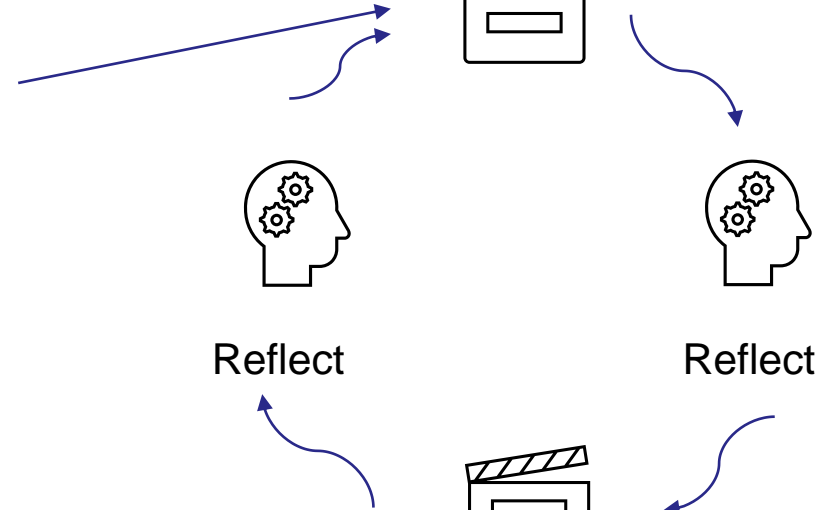
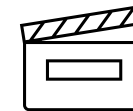
*Review own  
360 video*



Reflect



*Review partner's  
360 video*



# Planning for learning: a review of practice

- Watch Pre-Service Teacher 1's video



- *What do you notice about teaching?*
- *What do you notice about learning?*





# Planning for learning: a review of practice

- Watch Pre-Service Teacher 2's video



- *What do you notice about teaching?*
- *What do you notice about learning?*



# What are the key differences?

- *What opportunities are created for student engagement and dialogue?*



# PST S: Post reflection

Key focus points identified at the end of the reflection cycle for Presentation/Teaching Exp 1:

1. My confidence level and creating that comfort zone (I was much more cautious in my first presentation due to the cultural difference and my little knowledge about Australian culture and the slang)
2. Need more engagement
3. 'Less is More' was something really helpful that I learned from my presentation 1.



# PST S: Post reflection

After watching your second teaching presentation (how well have you addressed your areas for improvement?)

*I believe that I worked more on student engagement as I tried to create a presentation which might attract students to a greater extent. Further for student engagement ,I introduced the concept of colouring as kids would be highly fascinated towards this stuff. As less is more I think I tried to cover a very brief topic about the various views but I still think I have to work a bit more on my confidence level (though is enhanced from last time but still I have to increase it more)*



# PST S: Post reflection

Something that surprised you from watching your own video back?

*I didn't realize how much I moved between the board and the table of props during my presentation. While it didn't have a significant negative impact, it did make me look a little hectic!*

*Also, I think from the video I see that I seemed to focus a little more on the right hand side of the classroom (from the presenter perspective). I think this was an unconscious bias because that was the side of the room I was sitting earlier.*



# PST J: Post reflection

Key focus points identified at the end of the reflection cycle for Presentation/Teaching Exp 1:

*I think a strength of mine is in clarity of planning. I also believe I have a reasonably confident teacher presence, and am able to project a knowledgeable yet approachable persona to my students.*



# PST J: Post reflection

After watching your second teaching presentation (how well have you addressed your areas for improvement?)

*The major thing that I wanted to improve on was my over-reliance on memorised lines. In the first teaching presentation, I had committed to memory every single thing I was going to do and say. This rigidity meant that, when a slight deviation occurred, I became momentarily flustered. What I want to improve on is for me to be approach teaching in a more relaxed manner. This will allow me to be more “in the moment”, which will help me respond and genuinely interact with students more.*



# PST J: Post reflection

Something that surprised you from watching your own video back?

*I think I've made good progress on what I set out to improve on from the first presentation. I went into the second presentation well prepared and planned, but without committing every single line and action to memory. I felt more relaxed, and I think that there was much more room for me to breath and more opportunities for me to be "free" in my teaching.*





**What do you think they could/  
should learn from each other?**



# PST S's reflection from watching J

**How useful was it to watch your partner's video?**

Very useful.

**How exactly did watching your partner's video help you?**

I tried to understand teaching approach of my partner. We worked on the same lesson plan but still have a vast difference between the teaching approaches.



# PST S's reflection from watching J

**What are three things that you noticed from their video?**

1. He was really enthusiastic in his teaching.
2. The student engagement was significantly high as he called students up to board for answers which helped other students also to check their answers up.
3. His presence and clarity was commendable.

**Was there anything that surprised you from their video?**

His enthusiasm to teach really surprised me and for sure I would like to incorporate that aspect into my teaching.



# PST S's reflection from watching J

## **What did you learn about your own planning from watching their video?**

Merely giving questions to the students may not help in explaining the purpose. Calling students to the board may also help with improving learning.

## **What did you learn about your own teaching from watching their video?**

I was a bit underconfident and maybe my approach was more subject-centered but his was more student-centered. Overall, I felt I worked really well this time but as there is always scope of learning more.



# PST J's reflection from watching S

**How useful was it to watch your partner's video?**

Very useful.

**How exactly did watching your partner's video help you?**

It was extremely interesting to see how differently the same lesson plan was enacted by my partner. The contrast in instruction style and structure helped me reflect on what teaching approach I feel is then best way for me personally.



# PST J's reflection from watching S

**What are three things that you noticed from their video?**

1. S prominently features the use of powerpoint slides in her presentation. The visual aids were eye catching, though some of the text size appeared rather small (at least from the video).
2. The presentation was very much split into two main parts. First, a teacher centered direct instruction period, followed by students participating in an activity.
3. I'm not entirely sure if this is correct, but focusing on the students in the video, I think I noticed that there were times where certain student groups had finished the assigned task early, and were just casually waiting around for the next task to begin.



# PST J's reflection from watching S

**Was there anything that surprised you from their video?**

I was surprised that the presentation was so front loaded. My partner launched straight into explanation of elevations, followed with a full description of the activity. I think this was surprising because, in contrast, my presentation took a different approach with teacher instruction broken up between short student activity.



# PST J's reflection from watching S

## **What did you learn about your own planning from watching their video?**

Based on the way both of us did our presentations, it was very evident to me just how differently teachers can approach the same lesson plan.

One thing I noticed was my partner was much better at sticking to the timing in our plan as a result of having the block of direct instruction. In contrast, for me the time tended to “slip away” given the back-and-forth nature I took with the students. In the future, I will need to incorporate this understanding in my timing plans.





# PST J's reflection from watching S

## **What did you learn about your own teaching from watching their video?**

While watching my partners video, I was struck with the thought that, if I were a student, I would have had a better learning experience sitting through my own presentation. This is of course a biased view, but what I realized from this is that the model of teaching that I perform is based on, subconsciously, what I would want as a student. In that sense, my teaching would be perfect for a class of 25 copies of “me”. The reality, however, is that students are incredibly diverse, and all respond differently to teaching styles. What works best for me might not necessarily be helpful for me students. Moving forward, I think what works for me would be a good starting point, being easier for me to plan and model around, but I should be very willing to critically reflect and adjust for my student needs.



# Summary Comment

- Reviewing and reflecting on one's own practice is hard!

*"It's not easy to watch yourself, but I definitely feel as though I learned something about how I present myself in the classroom as a result" (Claire)*

- Students were able to draw on specific examples of their practice,
  - » reflecting on themselves as teacher,
  - » or from the perspectives of the learners in their learning experience
- 360degree video enables them to focus their reflection on the class and the learning environment as a whole rather than just themselves as teachers/teaching.



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Questions?



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