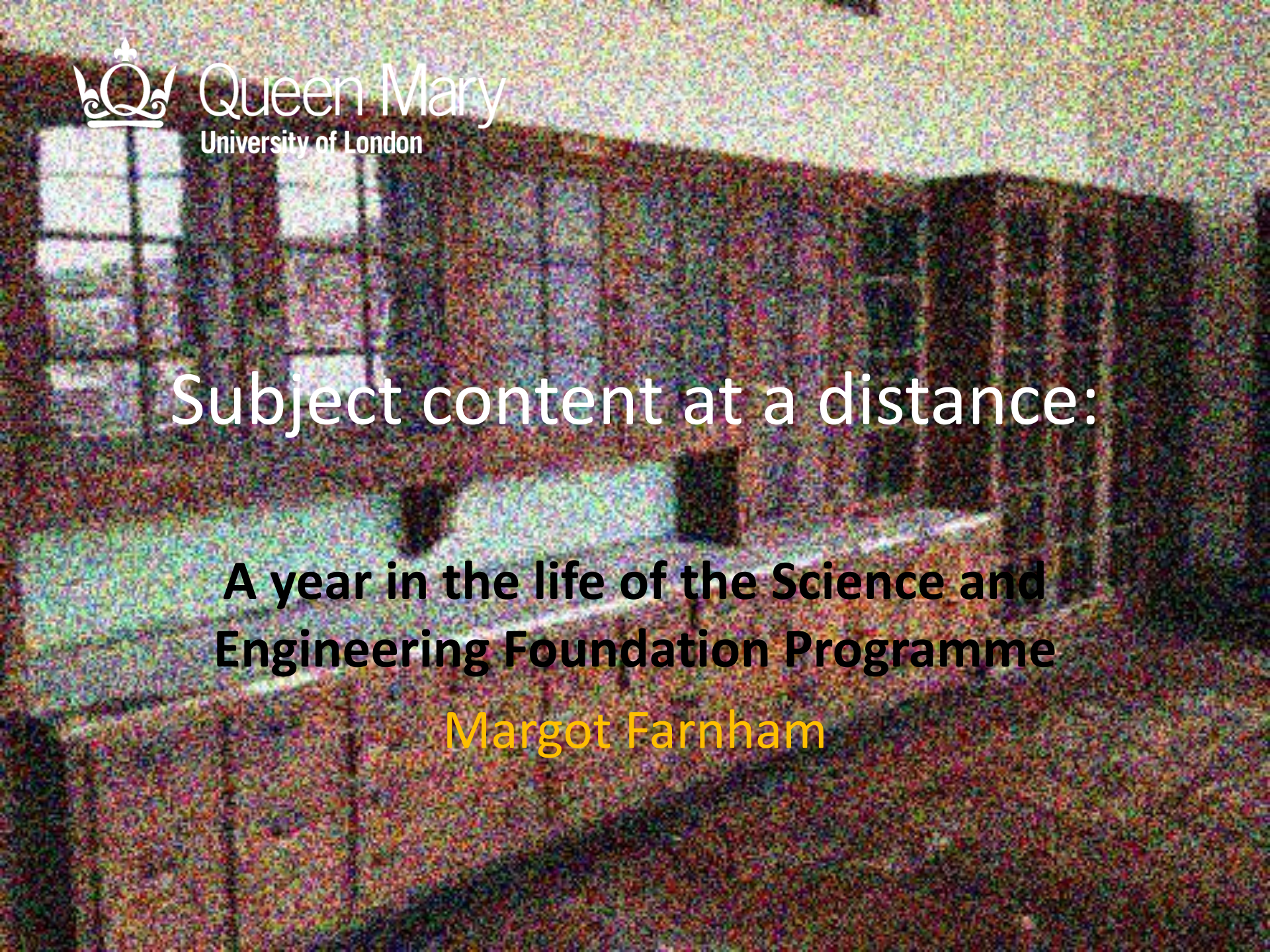

Subject content at a distance:

A year in the life of the Science and Engineering Foundation Programme

Margot Farnham

SEFP history

Our modules (E1 and CST) form part of one of the longest established Foundation Courses in the UK

It all began in 1978 in the School of Biological and Chemical Sciences …

and grew … and our modules moved to the Language Learning Unit in the 2000s…

General EAP

- Successful course
- Rationale to give students academic skills
- Not specific because science writing ‘limited’
- Creatively improvised over time
- Income not to Language Centre
- Teaching team includes staff on casual contracts

SEFP today

International Science and Engineering Foundation Programme (ISEFP)

A one-year foundation programme offering a pathway to a range of undergraduate degrees in science and engineering, only open to international students

Science and Engineering Foundation Programmes (SEFP)

Combines a foundation year with a traditional university degree in an integrated four- or five- year programme; open to home, EU and international students

The CST students 2016/17

Some always struggled with grades

8% registered with DDS

Programme	Total
Biology	**82**
Chemistry	32
Physics BSc	57
Physics Msci	11
Maths	40
Computer Sci	46
Computer Sci Msci	1
Engineering	**117**
Electronic Engineering	11
Electronic Engineering Msci	1
Materials Science	15
Grand Total	413

Some missed grades because of illness or home life difficulties

Significant numbers live with families and commute

Significant numbers work part-time jobs

Source: Sarah Lawrence

CST Changes: initial thinking

- skills of critical reading, thinking and writing within a task-based framework
- awareness of societal factors which have led to an increased need for public engagement
- knowledge of different types of public engagement

…. by using STEMM related materials and issues of relevance in contemporary life

Influences

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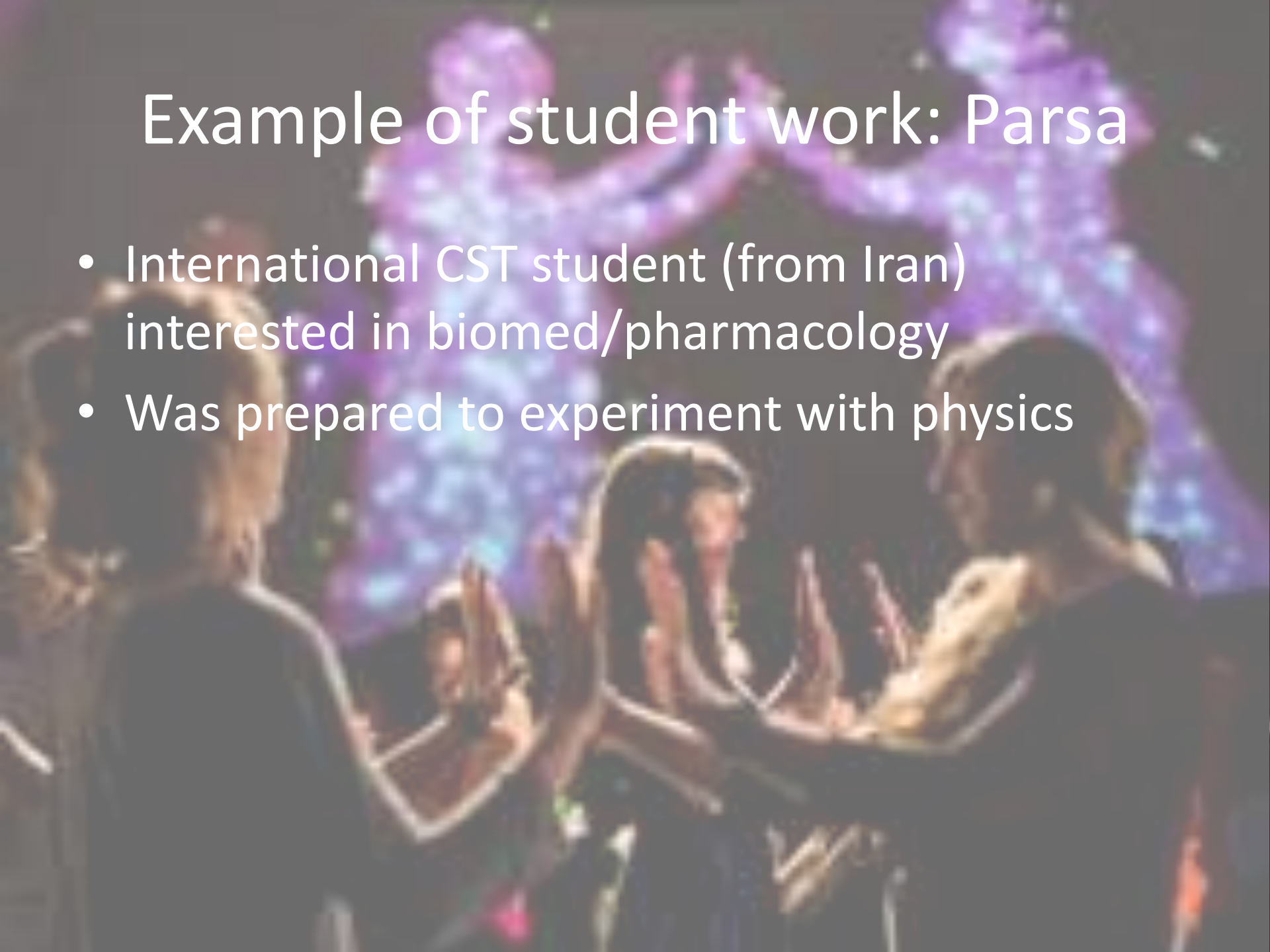
- HSS International Foundation Programme
- SEFP Module Leaders and Programme Director (see Exhibit A)
- Reading – a key text was Karen Bultitude (see Exhibit B)
- My own personality and pre-dispositions including experience in NHS

The key elements

- Input and output: Public engagement gone wrong: the MMR vaccine case study (students write a timed essay)
- Input: a frame for Science Communication and Public Engagement with Science (Bultitude)
- Input: case studies including crowd sourced research (Sea Hero Quest)
- Output: students write report, present findings and lead a discussion.

Example of student work: Parsa

- International CST student (from Iran) interested in biomed/pharmacology
- Was prepared to experiment with physics



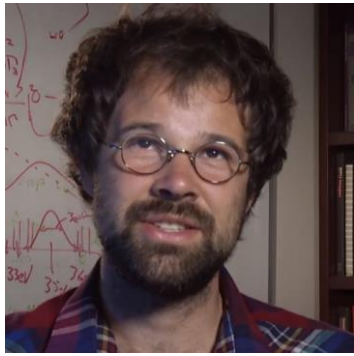
Dance room Spectroscopy (dS)

PARSA AIATOLLAHI

Background

- Spring 2011, Dr David Glowacki.
- Bristol University
- Project designed to bring people closer to the atomic world.
- 3D technology with molecular physics.
- Translates people's presence into energy fields.

Source: Google images



Source: Google images

The Science

Source: YouTube user drglowacki

Problem 1

- Mechanics drive nature.
- Certain mechanics occur at an atomic scale.
- Invisible to naked eye.
- Harder for scientist to come with new ideas and discoveries.
- Develop simple and effective ways to visualise and communicate how natural world works. (Glowacki, 2017)
- In the realm of the invisible, this is a significant challenge. (Glowacki, 2017)

Solution 1

- New attempt at visualising the nano-world
- Participant to "wander through, and interact with the nano-world" (Danceroom Spectroscopy, 2017)
- They trigger sound and images by movement.
- providing scientists with the solution to see their energy field surrounded by atoms and molecules with the naked eye

Problem 2

- Interest in quantum mechanics is low.
- The exposure of interest into this field is inclusive of individuals who are pursuing a career in quantum mechanics.
- Quantum mechanics is branch of physics relating to “very small, at the scale of atoms and electrons” (Science and News, 2017).
- Quantum mechanics has explained the structure of the atom and the structure of the nucleus. (Invigorate.royalsociety.org, 2017)
- Without knowing the structure of the atom, most of the physics and chemistry that we know today wouldn't have been possible.

Solution 2

- Introduces a wide variety of different groups of people to atomic and molecular physics.
- Taking part in events around the world
- TEDxTalk Bristol (2011) (Danceroom Spectroscopy, 2017)
- Cultural Olympiad (2012) (Danceroom Spectroscopy, 2017)
- Stanford art gallery (2014) (Danceroom Spectroscopy, 2017)
- Does not limit the amount of participant.

Source: Google images

Source: Google images

Impact

- UK National Research Engagement Award (2014)
- UK Media Innovation Award (2013)
- “Outstanding Contribution to Innovation” (Danceroom Spectroscopy, 2017)
- 100,000 people have took part in dS ranging from age 3 to 73. (Glowacki, 2017)

Source: Google images

Evaluation

- dS is a successful new project.
- STEM subjects.
- Interconnection of science and art.
- However still new.
- Not enough time to have a huge impact

Thank you for listening!

Reference

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Discussion

- If there was a dS exhibition in your area would you take part?
- Can you think of any other existing projects with regards to the exposure of scientific fields to the general public?
- How important is public awareness for the future of science?

Example of student work: Mahdia

Extract from UCAS Personal statement:

I also attended a DNA summer school (at Imperial College London), which showed me how restriction enzymes can be used to identify different bacteria through electrophoresis. This has exposed me to practical lab work at a higher, more professional level. … This insight has been further widened through my foundation course, as I have been able to complete a variety of labs at this higher standard, such as the identity of various microbes in different suspensions. Through this I have gained a valuable insight into the reality of biochemistry.

THE HEART AND LUNG REPAIR SHOP

By mahdia mim syeda

BACKGROUND

- Public mistrust in science due to apathy (castell et al 2014)
- National heart and lung institue at imperial college london (seakins, 2015)

Problem/Challenge

- Poor decision making due to public apathy (Castell et al 2014)
- Aim: to engage local community in cardiovascular and respiratory research
- Accessibility (Seakins,2015)

SOLUTION

- Pop up 'convenience' store open from Monday 7th july – Sunday 20th july 2014
- Visitors would participate in various activities
- (Harding, S., Haskard, D. and Fox, K, 2017)

HTTP://WWW.IMPERIAL.AC.UK/NHLI/INTERACT/PUBLIC-ENGAGEMENT/OUR-PROJECTS/HEART-AND-LUNG-REPAIR-SHOP/

Impacts

- Generally positively received
- 20% visitors had not participated in science communication before
- More than 60% from local community (W postcodes)
- 84 year age range with little-no gender bias
- (Seakins, 2015)

Evaluation

- Generally successful
- 50% of visitors did not know about event until walking past
- Convenient but confusing location
- Lack of social media presence
- (Seakins, 2015)

Reflection

- Various forms of scintific communication – some are more effective than others

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Discussion

- Why do you believe there is public mistrust in science?
- Are interactive methods of scientific communication, such as the heart and lung repair shop, more effective than traditional methods, such as lectures?
- How do you believe public mistrust in science can be recitfied?

Diary

29.11.17

This week the student presentations: pride, energy, involvement.

Parsa shares dance spectroscopy (wearing black and actually looking like a dancer!) Animated voice rises and falls in big waves of energy, moving his body throughout.

Kim covers chaupadi, menstrual segregation. A connection with her experience volunteering in Nepal where she also had to observe the practice.

Maisha covers euthanasia in a measured and scientific way.

Mahdia is the referencer of the week.

Reflection

- People, personalities and predispositions colour course content
- A fluid style of change can be achieved if communication channels are open
- Hybrid subject content can emerge
- SEFP spans both EGAP and ESAP and has been successful using both

And now …?

- Case study will be retained by Michele King current Module Convenor who sends her regards from Venezuela
- A bank of cross-disciplinary readings will be curated by Sharon Turner (see next session).

Thank you!