



TEACHING NOTES

ENTERPRISE + STEM

The
INVERGOWRIE
Foundation



FRANCINE MARQUES MEDICAL RESEARCHER

Synopsis

The case forms part of the Career Insights series, in which women STEM professionals are invited to talk about their STEM careers.

This case examined the career journey of Associate Professor Francine Marques who works as a Medical Researcher at Monash University in Australia.

This case explains Francine's pathway into a STEM career, and the life changing event that made her focus her vision for achieving impact.

Francine identifies many benefits of studying science as well as providing insight about the 'day in the life' of a scientist.

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Teaching objectives

The case forms part of the Career Insights series, where women STEM professionals are invited to talk about their STEM careers and share their advice for future generations of STEM professionals. This case explores aspects of Francine Marques' career in STEM as a Medical Researcher.

The case is intended to provide insight for students into one woman's STEM career journey.

The case covers areas, including:

- Factors that can influence students towards STEM careers
- The importance of leaving a legacy
- How values underpin impactful work
- The potential benefits to students from studying science

There are several approaches open to teachers for this case.

For a year 7–8 class, teachers can allocate the case as reading material for a tutorial type session, where the case can be analysed and discussed amongst a group of students. The case needs to be read in advance of the discussion session, to avoid delay and leave more time for the discussion of some of the key issues of the case. It is suggested that students are divided into manageable groups (between 2–3 students), where one student is the appointed spokesperson for the group. This helps to facilitate greater discussion about the case.

The students are encouraged to discuss the themes and discussion questions outline below. The facilitator can ask questions, one at a time, and request that students, in their

groups, explore and reflect upon the question in relation to the case and their future careers pathways. The teacher would ask a particular group for their answer and question their rationale behind their answers (probing their reasons). After students' views about the case have been obtained, the teacher should summate what he or she believes to be the correct answer(s) to the case questions.

For a year 9–10 class, the teacher can use the same approach as outlined for Year 7 & 8 students. Alternatively, the case is read by all students individually, and then they discuss the case with the person sitting next to them using the sample questions and discussion points outline below as a basis for discussion. In the case session itself, students can be assessed on their class participation. Furthermore, after the case session students are required to fill out a brief reflection outlining their most valuable contributions or comments during the class. Students can be awarded marks based on their case preparation, their depth of thought, the way they contribute to the discussion, their critical analysis, and synthesis of the case material, and their active involvement and contributions within the classroom situation.

The case ends with Francine offering advice as to the benefits of studying science and becoming a STEM professional.

Discussion sections and key themes

A curious mindset

- Here, the case facilitator can ask students to reflect on the factors that influenced Francine towards a career in STEM. What experiences did Francine describe in the case that sparked her curiosity in STEM?
- The focus here should be on the role of different people and childhood experiences in shaping future career pathways. In Francine's case, these included accompanying her dad into his workplace, and the subject she studied in school.
- The class can be asked if they can identify anyone in their lives whose career might interest them and be invited to explore how they might learn more about that person's career. For example, by interviewing them about their experience.



Making a difference through science

- In this section of the case, Francine talks about the area of research she works in.
- The class can be invited to identify key issues facing the Australian public and investigate the jobs that exist to help tackle these issues.

Day in the life of a scientist

- What does a Medical Researcher do at work?
- Here, the students could be directed to consider the many tasks Francine describes as being part of her workday.

Leaving a legacy

- A central element of this case is the life changing experience Francine experienced, and how this helped her to clarify her vision and values.
- The class can be asked to reflect on their 'legacy'. Ask them to explore what positive impact they would like to leave on the world.
- In the case, Francine talks about the values of 'fairness' and 'accountability', which underpin her vision and how she conducts herself at work. The class can be asked to brainstorm a list of values that they feel represent themselves.
- Invite students to explore how the values they have brainstormed could be used to guide their decision making and actions.

Studying science

- The case discussion can then move onto identifying benefits for students from studying STEM.
- Students can be invited to reflect on the benefits that Francine mentions and expand upon her list.

There are no 'right or wrong' answers to the above questions. The above suggested discussion points are aimed at encouraging students to explore Francine's journey as a Medical Researcher and to spur curiosity towards the overlap between being a STEM professional and leaving a positive impact on the world.

Outside or supplementary reading

The following reports are of interest to understand the future of STEM careers and opportunities within the STEM sector.

NHMRC's Gender Equality Strategy 2018-2021 (NHMRC, 2018)

This report details the NHMRC's strategy for achieving a gender-equal health and research workforce, and for supporting an increase in the retention of women STEM professionals and the career progression of women. The NHMRC is Australia's leading funding agency for health and medical research. The report highlights that gender equality is a fundamental human right, and that achieving gender equality is better for everyone. NHMRC's strategies for achieving gender equality are outlined in the report. Source: <https://www.nhmrc.gov.au/file/11921/download?token=X5HhS5F1>

We asked 6 scientists what inspired them to pursue a career in science. Here's what they said (The Conversation, 2022)

This article invited six scientists to talk about the things that inspired them towards a career in science. Namely, the influence of family, how the scientists were driven by their curiosity, and the importance of getting out and experiencing nature. Source: <https://theconversation.com/we-asked-6-scientists-what-inspired-them-to-pursue-a-career-in-science-heres-what-they-said-172397>

Girls' Future – Our Future. The Invergowrie Foundation STEM Report – 2020 Update (The Invergowrie Foundation, 2020)

This report provides an in-depth investigation of key topics in STEM, including career advice, role models in STEM, and addressing unconscious bias in STEM education. The report outlines the 'spheres of influence' model – which is a way of explaining the different groups that can influence girls' STEM storylines and how students develop identities around the characteristics of STEM professionals. This model can be used to explore the different influences that might exist in students' lives

and to identify areas in which positive role models can be drawn. Source: <https://invergowrie.org.au/launch-of-girls-future-our-future/>

The future of women at work (McKinsey Global Institute, 2019) This report is part of the McKinsey Global Institute's research program on the future of work, and it focuses on how the growing adoption and diffusion of automation and artificial intelligence technologies is likely to affect women in the workforce. In a scenario where automation unfolds on the scale of past technological disruptions, women and men could face job displacement and potential job gains of a broadly similar magnitude. In the ten countries studied, an average of 20 percent of working women (107 million) could lose their jobs to automation versus 21 percent of men (163 million) by 2030. Rising demand for labour could imply 20 percent more jobs for women, compared with 19 percent for men, assuming their shares of sectors and occupations hold. Entirely new occupations will also be created, but approximately 60 percent of new US occupations have been in male-dominated fields. However, the composition of potential job losses and gains for men and women could be different. Service oriented and clerical support occupations could account for 52 percent of women's job losses, but machine operation and craft work occupations could account for 40 percent of men's losses. Women are well represented in fast-growing healthcare, which could account for 25 percent of potential jobs gained for women, while manufacturing could account for 25 percent of jobs gained for men. Source: <https://www.mckinsey.com/featured-insights/gender-equality/the-future-of-women-at-work-transitions-in-the-age-of-automation>

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Supported by

The Invergowrie Foundation
Swinburne University
Griffith University
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