Biographies about women in science: why it is important to engage all learners

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draws on her PhD research to explain how biographies about women in science could be a valuable addition to your bookshelf

In recent years, the publication of children's non-fiction books about women has skyrocketed. If you step into any bookshop, you are likely to find a shelf, if not an entire section, devoted to biographies that present stories of women's achievements throughout history. Many of these books place a spotlight on women who are famous for their work in STEM-related fields. Popular titles include *Women in science: fifty fearless pioneers who changed the world* (Ignotofsky, 2016), *Little people, big dreams: women in science* (Sánchez Vegara, 2018) and *Fantastically great women scientists and their stories* (Pankhurst, 2021).

These books aim to inspire children to get excited about STEM, emphasising that STEM can be accessible for all. In a 2019 interview, Rachel Ignotofsky, author of *Women in science* (2016) said, *'I wanted there to be a story in there that everyone could relate to – no matter who they were or where they came from'* (Jonath, 2019). She continues: *'My hope is that both young girls and boys will read this so we can reframe history with a new sense of normal … that it will give them a new set of role models to aspire to so that anyone can be a leader and solve the world's biggest problems'* (Jonath, 2019). Ignotofsky's point about boys reading her book is an important one. Speaking informally with teachers, parents and other practitioners, I have found that there seems to be an assumption that boys are unlikely to be interested in reading these types of books. Given their clear marketing towards girls, such an assumption is certainly warranted. However, data gathered during my recent study exploring children's engagement with non-fiction books about women suggest that there are many factors affecting readers' engagement, the gender of the reader not necessarily being one of them.

In this article I begin by reflecting on data from this study to suggest that we should refrain from making assumptions about who will and who won't be interested in these types of books. I then discuss why it is important to suspend any preconceived expectations regarding the texts' popularity with particular groups of learners. Finally, I conclude by offering some recommendations on how we can facilitate all learners' engagement

Popular titles that place a spotlight on women who are famous for their work in STEM-related fields

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with books that celebrate the achievements of women in STEM. As will become clear, this is crucial for a variety of reasons.

The study

Between August and December 2020, I worked with eight children (ages 7–10) across the United Kingdom to explore their responses to and engagement with collective biographies about women published between 2016 and 2020. The children came from a range of backgrounds, each bringing their own unique set of experiences and knowledge to the study. The children were split across two groups of four, with two boys and two girls per group. I sent each child four books in the post and held individual interviews and group-reading sessions on *Zoom*. The children also chose their own arts-based methods for responding to the texts. Across the four books, the children were presented with almost 200 women, many of whom have achieved greatness in the fields of science, technology, engineering and maths. Without prompting, almost every child chose to read and discuss the biography of at least one woman working in STEM. Popular biographies included Marie Curie, Ingeborg Beling and Grace Hopper.

Is it true that only girls will be interested?

Having analysed the data, it is clear from my study that we must not assume boys' – or any reader's – disengagement with these types of texts. While the four boys in my study demonstrated an awareness that the books were not necessarily written 'for them', they nonetheless enjoyed engaging with them. In fact, the children's engagement seemed to be predominantly driven by their desire to learn about things that interested them. For example, Conor was particularly interested in the biography of German scientist, Ingeborg Beling (Pankhurst, 2020), famous for her work on bees, primarily because he loved bees. When I asked him what he liked about Beling's biography, he replied, *'bees are just like some of the smartest animals in the world and people before just underestimated them, just being chaotic, um, insects, which now that goes to the wasp'.*

Marie Curie

Similarly, Lucas's engagement with the biography of Marie Curie (Pankhurst, 2016) seemed to be prompted by his interest in the periodic table and the circumstances surrounding her death. After reading the text he asked, *'How did she die and when?'* Eager to find the answers, he started typing in the *Google* search engine, before proceeding to look up the meaning of various symbols in the periodic table. Thus, contrary to the assumption I had heard time and time again that boys would be 'put off' by the books' gendered marketing, this is not what I observed. Granted, this was a small study, and the experiences of these children are not representative of all children. However, they do stand as a stark reminder that we must not homogenise certain groups, nor presume engagement based on certain characteristics.

Why is it important and valuable to engage all learners?

This is important, as the value of engaging all learners with materials about girls and women in STEM is manifold. The work of esteemed professor of education, Rudine Sims Bishop, is particularly helpful here. In 1990, Bishop coined the phrase, *'windows, mirrors and sliding glass doors'* to explain how children see themselves in books and how they can also learn about the lives of others through literature (Bishop, 1990). '*Windows*' refers to the idea that books can give readers a glimpse into the lives and experiences of others. This is important when we think about girls and STEM. Of course, we need to create a culture where girls feel safe and encouraged to pursue their interests, but we need everyone to support this endeavour. As Elaine Millard and Petula Bhojwani (2013: 47) argue, *'it is by reading and composing and questioning texts together, and not by imposing girl- or boy-friendly initiatives, that all children can be encouraged to build an understanding of the changing nature of gender differences as they develop across cultures and time'.* Indeed, sole responsibility should not be placed on women and girls to address the gender gap in STEM. Collective effort is needed.

According to Bishop (1990), books can also serve as '*mirrors*', where readers see themselves represented. If you belong to a marginalised group or community, seeing people from the same background as you or people who have the same characteristics as you can be powerful. It can be a means of self-affirmation. Additionally, facilitating all learners' engagement with these types of books can help advance a more holistic understanding of the world we live in. Women's stories are human stories, and books such as these offer a valuable contribution as we continue to make sense of the world, our experiences, and our histories. As such, they can be useful for making cross-curricula links with subjects like history, PSHE and literacy. Finally, given the variety of topics and contexts that these books cover, it is unlikely that learners won't find at least one element that interests them. Any sliver of interest, no matter how small, can spark engaging discussions about scientific topics and broader issues.

So, how do we engage all learners?

For all children to discover the treasure trove of possibilities that these books offer, we might need to foster engagement and encourage perusal beyond the front covers. As such, some recommendations for practice are outlined below. The *Resources* section also lists

some collective biographies about women in STEM with additional downloadable resources.

- Spend time flicking through the books yourself and try to find possible points of connection and/or relatability for learners. As mentioned above, these collective biographies have a rich variety of content, and you will probably find creative ways 'in' that are tailored to learners' current interests and preferences.
- Encourage questioning and exploration. Learners might have expectations that biographies are complete, factually accurate, and cannot be questioned. However, biography is *'only and always how one person sees another person. It is an image created by the biographer's art'* (Meltzer, 1986: 173). As evidenced in my study, learners' experiences of reading can be enriched when they have autonomy to undertake their own research.
- Consider the cross-curricular benefits of having a selection of these books on your shelf. They could be used to explore vocabulary, to teach literary devices and techniques, or to inspire biographical writing tasks.
- Use or take inspiration from the texts' supplementary resources. For example, Bloomsbury have created an activity pack based around Kate Pankhurst's *Fantastically great women* books, Ignotofsky offers an array of beautiful resources on her website, and many of the texts provide details of references, sources and additional resources as part of their end-matter.

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Resources

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Ignotofsky, R. downloadable resources: rachelignotofskydesign.com/free-downloads

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