Vocational Pathways and Statistics

From NZSA Education Committee, May 2022.

The Pathways Advisory Group includes people concerned about the Mathematics and Statistics on offer at present

The NZSA Education Committee has been discussing concerns with Group and Committee member Rachel Passmore. This note comes from the Education Committee, and aims to briefly state these concerns, and possible ways forward. We intend it as background for the Ministry's Curriculum Refresh team, and the Subject Expert Groups for Mathematics and Statistics. We aim to promote discussion, rather than provide proposals, at this stage. We don't have opinions about the mathematics side, but we see the solutions as including both sides together.

The concerns are for the group of ākonga who are heading for a non-academic pathway. The concerns are about two areas: skills for managing and contributing as citizens, and skills for the workplace. Because these ākonga tend not to go beyond Year 11 maths and stats at present, but stay at school until Year 13, there are two years where they are not engaging in and practising the quantitative thinking and skills necessary for their occupations and participatory citizenship. The new Numeracy co-requisite standard should provide a foundation. The developing NCEA Level 1 Achievement Standards should enable ākonga to build on this. The Level 2 Standards may enable them to further develop their quantitative skills. We would like to see developers exploring options at Level 2 to engage ākonga in statistical thinking

Lack of preparedness of these ākonga in maths and stats skills when embarking on their chosen occupation continues to be a long-standing problem area for vocational educators. It is a problem that needs to be resolved.

These concerns surfaced in last year's curriculum-related investigations.

The complexity of mathematical and statistical needs is rising

The needs for citizens are rising, in issues like health, social justice, and sustainability, and in public debate about these. The needs in the workplace are rising too, with increasing amounts of data and graphics about them, and increasing use of tools that process data and produce graphical and numerical results.

Possible ways forward; a specific 'vocational' qualification?

On the statistics side, the starting focus could be graphs: how to decode, critique, read, improve, and use them; and how to get at the data behind them. Unconventional graphs are emerging all the time, and people will need skills for dealing with those. Interpretation of graphs used in particular occupations could be focused on, depending on the interest of the student, as well as text discussing statistical ideas and findings.

Equipping ākonga with the skills to identify misinformation is also becoming increasingly important, a need that has been highlighted during the pandemic. Some education on how social media algorithms operate and how to question what appears in the media might also offer some engaging contexts for these ākonga.

A specific ‘vocational‘ qualification in maths and stats needs to be considered. It would be part of a separate and equivalent pathway.

We would be happy to investigate with people from the vocational side what statistical skills they would like these ākonga to acquire.

The new NCEA may provide space in the school year for alternatives like this. For example, an online course could be provided that focused on quantitative thinking and skills that would be useful for a variety of occupations (e.g., nursing, building, horticulture) and citizenship.

Incentives for taking the qualification would be needed. As examples, these incentives could include preferential entry into chosen apprenticeship, shortened completion time for apprenticeship, etc.

Sources:

The work on statistical literacy for citizenship by Iddo Gal and others, and in ProCivicStat:
Iddo Gal - Understanding "Civic Statistics" — Stats + Stories (statsandstories.net)
https://iase-web.org/islp/pcs/

FigureNZ:
https://figure.nz/