

Māori Technological Capacity I: Perspectives of a physical scientist

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Abstract: Hook (2007) urged Māori to engage more fully in science and technology (S&T) as a means for “socio-economic uplift”. To that end, a model including factors influencing the technological capacity (of Māori) was presented. The present author views technological capacity as one measure (of a number of possible measures) indicating the overall “health” of the collective (Māori). The advantage of this view is that it is *naturally* incumbent on the collective to foster environments that provide for scientific development. On the other hand, the negative perceptions of Māori toward S&T are acknowledged. Even so, Māori partake of the “fruits” of S&T daily, and this engagement is only likely to increase. It seems unsatisfactory (to this scientist at least) to continue at the periphery of S&T development. Building technological capacity will depend on relationships between Māori and non-Māori. The work of numerous individuals and groups engaged in increasing the participation and achievement of Māori should be acknowledged.

Keywords: Human capital, indigenous assets, knowledge assets, Māori social capital technological capital

The target article by Hook (2007) pointed to policies that are “propelling this country towards a high-tech knowledge economy.” It was suggested that Māori needed to engage in such an economy, because it provided an opportunity for socio-economic uplift of the collective. The concept of technological capacity was introduced, and some of the “various societal relationships that might influence that capacity” were described. The treatment did not propose to be a definitive model, Hook stated it was: “... a first attempt to understand the dynamic relationships that exist between the socio-economic capacity of an ethnic minority and the dominant culture.” It may be that this model will provide useful insights; at the very least (and as intended) it has highlighted the issue of engagement by Māori in science and technology (S&T).

This commentary proffers the perspectives of one physical scientist working in the tertiary education sector. In making this statement, the possibility of inherent biases associated with being a scientist should be understood. Moreover, the term physical science (typically the study of the non-living, and in this case physics) has been used to distinguish ones-self from the biologist say. In doing so, it is to be recognized that the author’s statements reflect only one of a possible range of (scientific) view-points. Furthermore, I cannot profess cognisance of the range of issues that may face scientists of alternate persuasion. It is simply my hope that further discussion be stimulated, by adding to the discourse the view-points of one practitioner of the sciences (of physical disposition).

Hook (2007) defined technological capacity (TC) as the combination of (technological) social capital, human capital, physical assets and knowledge assets. He discussed how the technological capacity could be manipulated (via these variables), to increase this capacity. In other words, technological capacity was used as a measure to be maximized. Attention was paid to the mechanisms (post-graduate studies, business, government) that exist to achieve this optimization. It seems reasonable to suggest a complementary view, i.e., technological capacity as a “health measure”. In other words, one of a number of measures, that attempt to quantify the ability of the collective (Māori) to adapt/respond/engage to particular challenges presented in a global environment. In this instance, those challenges are of an S&T related

nature.

The advantage of the “health measure” interpretation is that it follows that technological capacity, being an indicator of well-being, is *implicitly desirable*; consistent with Hook’s view-point. That is to say, it is a *natural* component of the collective health of Māori, rather than some measure to be increased/optimized. Furthermore, if it is indeed a health measure of the collective, then it seems incumbent upon the collective to ensure that scientific and technological pathways are open to those who choose to follow them. Underlying this theme is the importance and well-being of the *individual*, and the contribution of the individual to the whole through *diverse measures*. The critical importance of support from family and an environment that encourages one’s strengths (scientific or otherwise) is to be emphasized. It is certainly true that a number of initiatives operate in the tertiary sector, and at a governmental level to encourage participation in science pathways. The work of numerous individuals and groups must be acknowledged (see for example the following, Health Workforce Advisory Committee, 2005). Returning to the collective however, one is quickly brought back to Earth by the low participation and achievement statistics of Māori in science and technology (as evidenced by Hook’s Table 1).

The question may be asked: what factors have contributed to the lack of participation and success in science and technology? Is there a lack of enthusiasm for the tenets of a scientific culture? In inflationary language, is there an anti-scientific culture prevalent within Māoridom? Certainly, Hook rejected the idea that Māori are of “qualitative mentality,” though could not disprove that assertion with the data provided. The literature hints at the negative perceptions of Māori toward science and scientists (Cram, 2002). Socio-economic factors and priorities must be considered, as well as the quality of educational experiences. Taurima, for example has pointed out classroom issues to the learning of science: “... barriers included fear of criticism, fear of being considered incompetent, fear of what other teachers might think, feelings of vulnerability and the desire to keep good ideas confidential.” (Taurima, 2007, p.1). In short, the reasons are multi-factorial, and I cannot profess to provide answers. I only suggest that technological capacity is a valid part of the overall well-being of the collective; and emphasize that it should be regarded as such.

On the other hand, and perhaps ironically, it would be difficult to argue that Māori reject S&T altogether. Scientific and technological endeavour pervade our lives: the provision of electricity and water, everyday goods and transportation, to computer, cell-phone and internet technology. In fact, many of the innovations of science and technology are taken for granted, not only by Māori but by society in general. Consider also the rapid development of computer technology. Moore’s Law (proposed in 1965) predicted that the number of transistors on an integrated circuit board (related to computing power) would double every two years. That law holds today, and has pushed and continues to push the digital revolution even now (BBC News, 2005). The “digital drive” has irreversibly changed our lives; and it is likely that high-end technology will only become more entrenched in our everyday lives.

As a result, Māori may have no choice but to adapt. Hook stated in this regard: “Māori may not have any choice as to whether a technological future is acceptable or not, because part of the world may necessitate the acceptance of realities that lie outside of their control.” This can be taken as a further challenge to Māori. How will we (the collective) position ourselves in a move to a knowledge economy: as consumers of the outcomes of science and technology, or as creators and innovators in S&T? There are at least two good reasons why a scientist might balk at the former suggestion: (i) science is a creative process, it seems totally unsatisfactory to (willingly) take a side-line role in the process of creation and innovation, (ii) as a scientist it is (on the whole) un-natural to be content with using “the thing”, but unconcerned with knowing any further (i.e., with the workings of “the thing”). In other words, it is my modest

hope that Māori will play a role in scientific and technological future, not only for potential economic benefits, but perhaps more importantly, to play a part in the processes of invention and discovery which are integral to S&T.

Finally, Hook stated that the total capacity of Pākehā was much greater than the total capacity of Māori (Eq. 5), and “*therefore* TC_m is very much influenced by TC_p .” I do not agree with the assertion that TC_p being in itself *large* implies the conclusion. As a simple counter-example, consider the “lost tribe” scenario: an undiscovered group of people has its own technological capacity independent and unaffected by the (vast) majority. The total capacity of the nation is the combination of the two capacities, though each group is oblivious to the other's existence. It is only when one or both groups become aware of the other, can technological capacity of one group be influenced by the other. However, I do concede the reality of the conclusion: the technological capacity of Māori will be and *is* much influenced by non-Māori (I have taken a more general view of the term Pākehā in this commentary). The principle of least action suggests that non-Māori will provide a *significant* part of any attempt to increase Māori technological capacity. In practical terms, I suggest that the small and dispersed nature of Māori human and social capital (technological) is simply too diluted to provide a workable framework at the present time. To this end, Hook identified the role of institutions such as businesses, governmental agencies and universities. It seems that any solution will rely principally on the uptake of skills and institutions developed (in the main) by non-Māori. Again, the issue will be the degree to which Māori are willing to engage in the process.

In summary, a re-casting of technological capacity emphasizes the responsibility of the collective (Māori) to foster a culture that provides for scientific creativity. At the same time, negative perceptions of S&T are acknowledged. Māori partake of the “fruits” of S&T on a daily basis; and this engagement is only likely to increase. As a scientist, it is unsatisfactory to adopt a passive role in any “knowledge economy”. Even more so, given the possible benefits of S&T for the whole, as well as the individual (i.e., as a means for expressing one's own creativity). Any meaningful attempt to increase technological capacity will depend on Māori technological capacity, but to a large extent on that of non-Māori also. The work of numerous individuals and groups engaged in increasing the participation and achievement of Māori must be acknowledged.

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