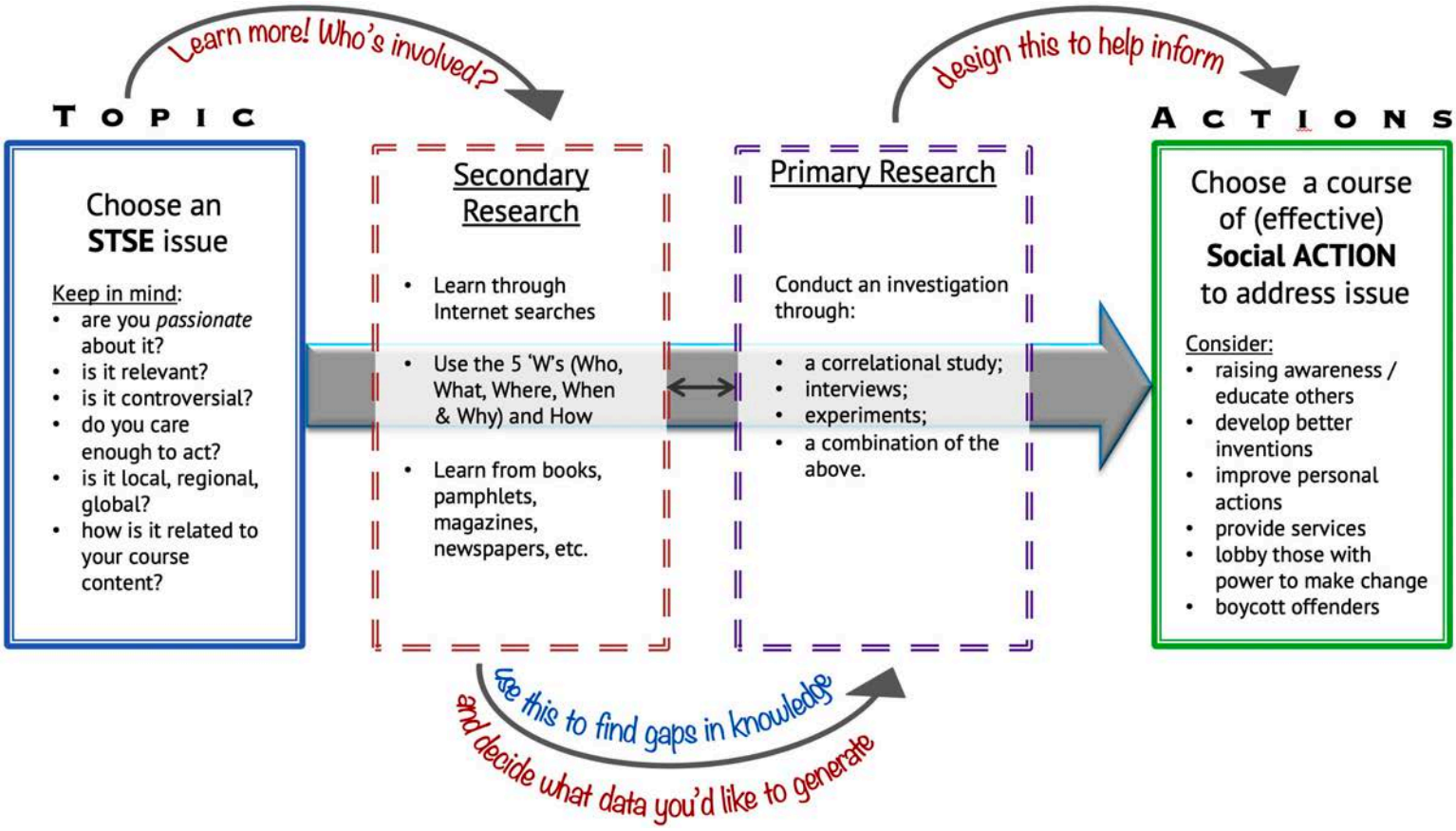
# STEPWISE

SCIENCE & TECHNOLOGY EDUCATION PROMOTING WELLBEING FOR INDIVIDUALS, SOCIETIES & ENVIRONMENTS

http://stepwiser.ca

STEPWISE is a framework for science (& technology) education to help students to develop expertise, confidence and motivation for *eventually* - after teacher lessons & student activities (refer below) - *self*-directing research-informed and negotiated action (RiNA) projects to address harms they perceive in relationships among fields of science & technology and societies & environments (STSE), ultimate causes of which may be economic pressures on scientists and engineers.




Although the ultimate goal of STEPWISE is for students to conduct student-directed (SD) and open-ended (OE) RiNA projects, with such autonomy being their democratic right, SD/OE RiNA projects likely will be limited without prior teacher lessons and student practice activities. Limits on self-discovery include: i) some students' limited abilities to discover certain abstract ideas, etc.; and, ii) capitalists' limitations of publicly-available information. To help overcome such limitations on self-discovery, we recommend that teachers first provide a 'mentorship' involving:

i. Students expressing their pre-instructional attitudes, skills & knowledge (ASK) regarding practices & products of science & technology (e.g., evaluating commodities);
ii. The teacher using direct instructional methods (TD/CE) to ensure all students understand difficult-to-discover ASK, such as harms to wellbeing of individuals, societies & environments (WISE) due to influences of powerful people (e.g., financiers) & groups (e.g., corporations, think tanks & trade organizations) on fields of science & technology and RiNA projects others have conducted to address some of them;
iii. Opportunities for students to practise brief RiNA projects (mostly SD/OE), with progressively less teacher supports.

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| | OE | |
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| **Provide some** - since, after TD/CE lessons, students likely need practice to 'solidify' (& evaluate) ASK taught earlier. | | **Ultimate Goal** - SD/OE RiNA projects need to be prioritized, to fulfill citizens' democratic rights to self-determination. |
| TD | | SD |
| **Provide some** - since, as at right, many students cannot discover through inquiries some problematic ASK in STSE relationships. | CE | **Avoid these** - because students' abilities may limit self-discovery, and because 'public' information may be limited by powerful people. |

PROCEDURES: Teacher-Directed (TD) <——> Student-Directed (SD)
CONCLUSIONS: Closed-Ended (CE) <——> Open-Ended (OE)