

Table 2. Merits and Deficits of Modes of NOS Instruction.

<i>Mode</i>	<i>Merits</i>	<i>Deficits</i>
Inquiry	<ul style="list-style-type: none"> • helps motivate engagement through personal involvement • fosters personal integration of lessons • supports understanding of constructed interpretations, models, forms of evidence, and model revision • develops experimental competences: framing hypotheses, designing investigations, handling data, evaluating results • relates NOSK to inquiry skills and methods 	<ul style="list-style-type: none"> • may not inspire curiosity or interest in initial problem • may be viewed as artificial exercise or school “game,” not as genuine science • when investigations “fail,” can prompt negative emotions, alienating student from NOS lessons • typically shuttered off from cultural, social, or political contexts • hard to model role of “chance,” or contingency • requires substantive amounts of time and resources
Historical Case	<ul style="list-style-type: none"> • helps motivate engagement through cultural and human contexts and through narrative format • can support understanding of long-scale and large-context NOS features: esp. conceptual change, and cultural/biographical/economic contexts of research problems and interpretive biases • can support understanding of investigative NOS: problem-posing, problem-solving, persuasion, debate • can support understanding of complexity of scientific practice, as well as historical contingency • supports analysis of process and product, since ultimate outcomes are known • when framed in inquiry mode, can develop scientific thinking skills — more efficiently than with hands-on inquiry • can foster understanding of error and revision — without risking emotions of personal failure 	<ul style="list-style-type: none"> • may seem “old” and irrelevant • if text-based only, limits development of hands-on experimental competences • if rationally reconstructed only or presented as final-form content, does not support understanding of “science-in-the-making”

<i>Mode</i>	<i>Merits</i>	<i>Deficits</i>
Contemporary Case	<ul style="list-style-type: none">• helps motivate engagement through authenticity and “here-now” relevance• can support understanding of cultural, political and economic contexts of science• can support understanding of how science and values relate• develops scientific literacy skills in analyzing SSI	<ul style="list-style-type: none">• cannot be fully resolved, leaving uncertainty and incomplete NOS lessons• cannot exhibit details of process which are not yet public or are culturally obscured