

Views About Science Survey

Taxonomy of VASS - P 204

Scientific dimensions	Items
<p>1. Epistemology:</p> <p>E1 Science is a <i>coherent body of knowledge</i> about <i>patterns</i> in physical realities (real systems or phenomena), - rather than a loose collection of particular empirical facts.</p> <p>E2 A given pattern is defined by a limited number of <i>primary</i> aspects <i>common</i> to a variety of physical realities, - and not by a comprehensive similarity in all possible features that may actually be attributed to all concerned realities.</p> <p>E3 Primary aspects of physical realities, and especially <i>explanatory</i> or causal aspects, may need to be <i>inferred</i> from certain observations, - and are not necessarily exposed directly to our senses or detectable through instruments.</p>	<p>5, 6, 7</p> <p>8, 9</p> <p>10, 11</p>
<p>2. Methodology:</p> <p>M1 The methods of science are <i>theory-laden</i>, <i>systematic</i> and <i>generic</i>, - rather than idiosyncratic and situation specific.</p> <p>M2 Natural patterns are usually <i>unveiled by careful investigation</i>, - rather than discovered accidentally through direct perception of physical realities.</p> <p>M3 Scientists may follow <i>variety of methods</i> and rely on a <i>variety of theories</i> to investigate a given physical reality from different perspectives, - rather than on a single method governed by a particular theory.</p> <p>M4 Mathematics is used by scientists for processing information efficiently, - rather than for mere number crunching.</p>	<p>12, 13, 14</p> <p>15, 16</p> <p>17, 18</p> <p>19</p>
<p>3. Viability:</p> <p>V1 Scientific <i>conceptions</i> (concepts, laws, models) are <i>invented</i> by scientists to represent physical realities in some respects; - they are not necessarily inherent in the nature of such realities.</p> <p>V2 Every scientific conception has a <i>well-delineated function</i> within a particular scientific theory, but a <i>domain</i> that may extend to a multitude of physical realities throughout the universe. - No two conceptions can serve exactly the same function, and no conception is generally restricted to localized realities.</p> <p>V3 Every scientific conception is <i>corroborated</i> with <i>reliable evidence</i> from the empirical world, - rather than faithfully accepted from particular scientific authorities.</p> <p>V4 Scientific knowledge is <i>approximate</i>, <i>tentative</i>, and <i>refutable</i>, - rather than exact, absolute and final.</p>	<p>20, 21</p> <p>22, 23, 24</p> <p>25</p> <p>26, 27</p>

Pedagogic dimensions	
<p>4. Readiness to learning:</p> <p>D1 Science is <i>learnable by anyone</i> willing to make the effort, - not just by a few talented people. 29</p> <p>D2 Achievement depends more on <i>personal effort</i> and <i>perseverance</i> - than on the influence of teacher, peers or textbook. 30, 44</p> <p>Understanding favors:</p> <p>D3 students who come to class with a prepared mind, - rather than those who study only after the teacher covers materials in class, 31, 32</p> <p>D4 and those who seek scientific information from alternative sources and discuss it with peers, - rather than those who stick to the textbook and their own ways of doing things. 33, 45</p>	
<p>5. Reflective thinking:</p> <p>For meaningful understanding of science, one needs to:</p> <p>T1 concentrate more on the development of <i>generic methods</i> for <i>construction</i> and <i>deployment</i> of scientific ideas, - than on memorizing facts and procedures; 46, 47, 48</p> <p>T2 model a situation and investigate it in <i>many ways</i>, - instead of relying exclusively on a formula-centered approach; 34, 35</p> <p>T3 continuously <i>evaluate</i> one's own work for <i>consistency</i> and <i>effectiveness</i>, - instead of just accumulating new information from presumed authorities; 36, 37</p> <p>T4 <i>reconstruct</i> new subject knowledge in one's own way while delineating its <i>scope</i>, - instead of memorizing it as given and without realizing its viability conditions. 38, 39, 49</p>	
<p>6. Personal relevance:</p> <p>R1 Science is <i>relevant to everyone's life</i>. - It is not of exclusive concern to scientists. 40, 41</p> <p>R2 Studying science should be an <i>enjoyable</i> and a <i>self-satisfying</i> experience, - rather than a frustrating one undertaken to satisfy curriculum requirement and other people's expectations. 28, 42, 43</p>	