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Comparative study of the National Primary Science Curricula in Finland and China

Aiming for scientific literacy and 21st century competencies

Research Question

1. What have the academia and international organizations conceptualized of scientific literacy and 21st century competencies?
2. Have the National Primary Science Curricula in Finland and China adopted the 'international standards'? If yes, how have they nationally recontextualized the objectives of scientific literacy or 21st century competencies?

Theoretical background

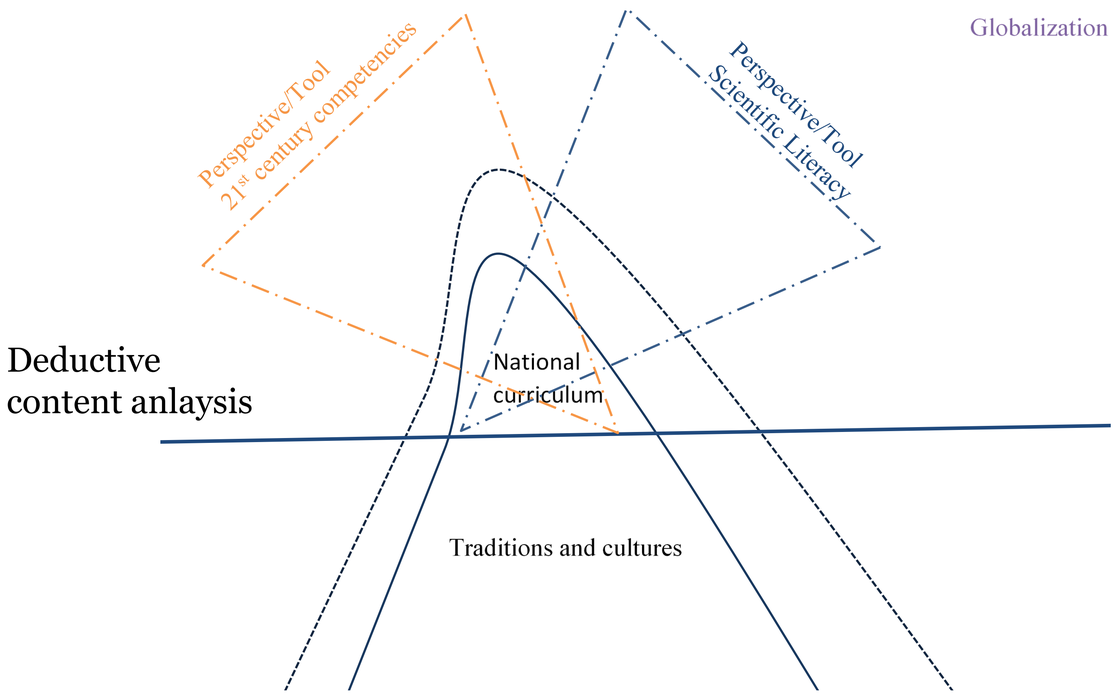
1. Three visions for scientific literacy

	Vision I	Vision II	Vision III
Characteristics	Skills and knowledge within science; learning for personal growth; future scientists.	Understanding and applying knowledge and skills in science and technology; learning for individual and societal participation; public understanding.	Learning through science; Values-driven transformation of both individual and society; Emancipation and societal participation
Curriculum Design	Solid foundation orientation, Well-structured in discipline	Context-based science education, classical STS curricula	Socioscientific issues-based curricula

2. Two western traditions in curriculum

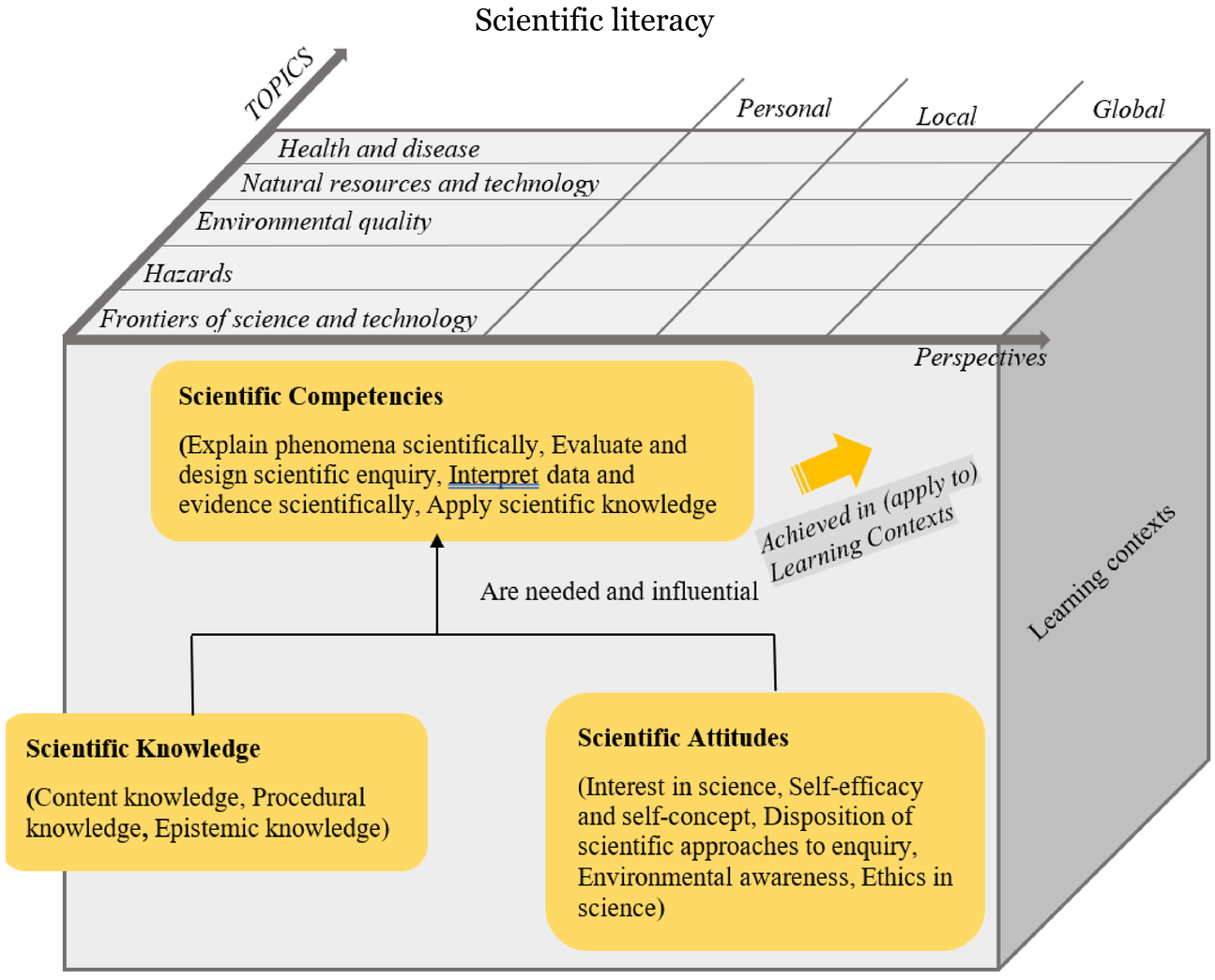
Category	Anglo-American curriculum	Bildung-Didaktik
Core question	How	What and why
Content as	Object	Example
Aims as	Task	Goal
Lesson plan as	Course action	Frames of references
Teaching as	Enactment	Licensed
Core orientation	Learning subject matter	Bildung

Research Design



Analytical Frameworks

Scientific literacy



21st century competencies

Ways of thinking	Ways of working	Tools for working	Living in the world
Critical thinking, Creative thinking, Metacognition	Inquiry, problem solving, collaboration, communication	ICT, Information literacy (including using concepts in science)	Citizenship, life and career, personal and social responsibility

Findings

Generally, both curricula illustrated an integration of Visions I and II with implicit views from Vision III ($f_{knowledge} > f_{competencies} > f_{attitudes}$, the learning contexts are thoroughly integrated into the contents). However, the Chinese Curriculum was organized emphasised on academic disciplines, tending to Vision I compared with the Finnish Curriculum.

Each curriculum showed the integration of the aims for 21st century competencies in it. Both curricula showed an emphasis on aims related to science education, such as inquiry and information literacy. Yet the density of appearance of competencies for 21st century in the Chinese curriculum is lower than the Finnish.

In general, the Chinese curriculum has a tendency to align with the Anglo-American curriculum tradition whereas the Finnish curriculum is more closely aligned with the *Bildung-Didaktik* tradition.