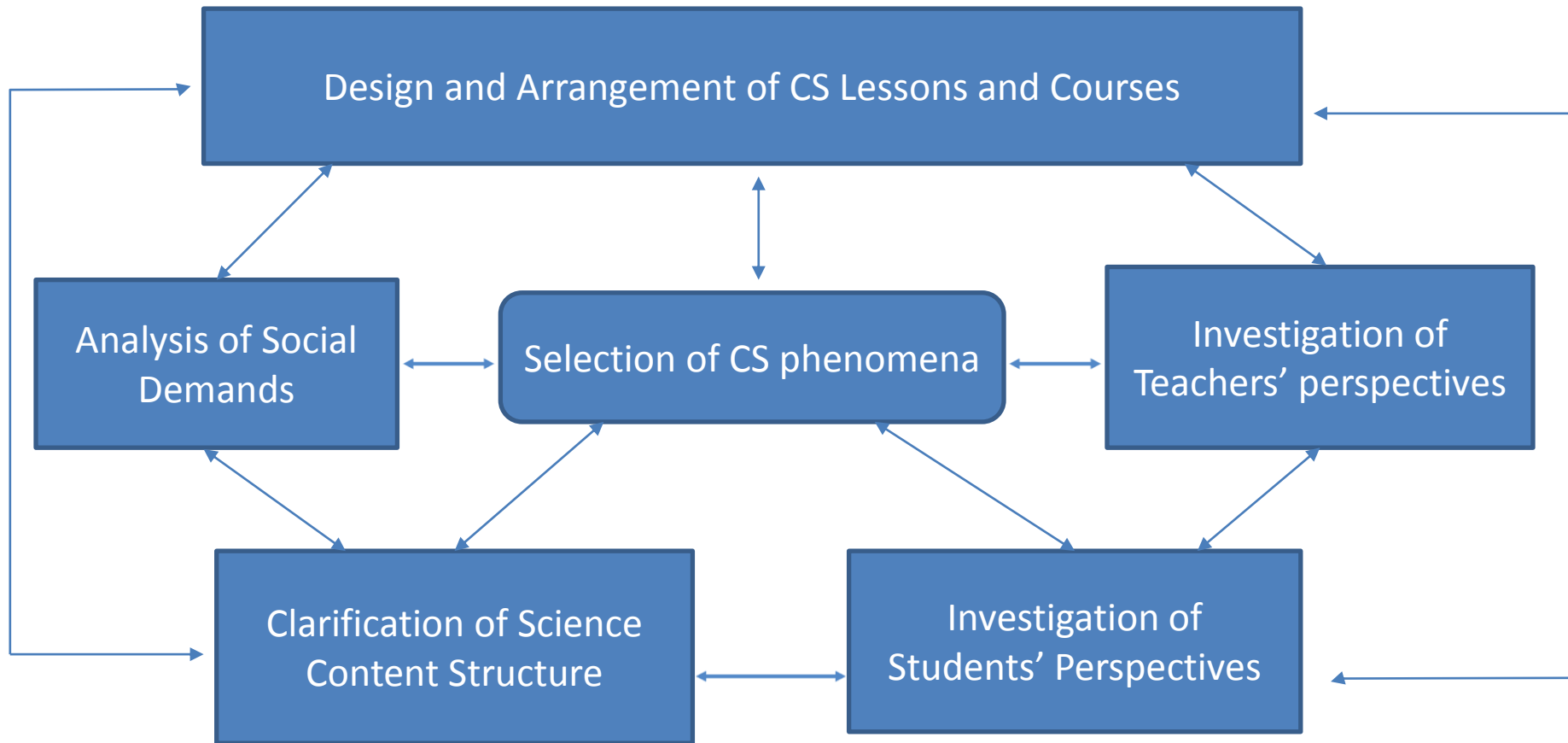# Making construals

A contribution towards a new curriculum for computing

CS Education Reconstruction
(adapted from Grillenberger and Romeike, WiPSCE 2015, p89)

Social demands

- dependency in software – "sw crisis"
- experiential aspects of computing
- intelligibility of code and its impact (Code Acts in Education)
- negative impact of sw approach on the human maintenance processes – explosion of effort ('external dependency maintenance')
- blending of CS and ICT

Selection of CS phenomena

- computational thinking / algorithms / data structures etc as traditional 'core': *complement:*

- data representation – empirical practices

- spreadsheet use

- experiential aspects – especially semantics

- web science

- sw development – requirements capture

- agile development

Student perspective

- new media – phones, social media
- bridging theory and practice
- inter-disciplinarity
- integrating formal and informal
- low threshold + high ceiling sw development
- contextualising the abstract and formal

What do students need to know?

Teacher perspective (?)

- OER adaptable
- instrumentation / novel modes of assessment interactive evaluation
- appropriate simplification
- meeting existing statutory curriculum constraints
- suspension of activity in development
- re-use, repurpose, trace stream-of-thought

Clarification of Science Content Structure

- What was ventured in the EM project
- Modelling with experience: construal and construction for software – EM paper #114
- iTAG tutorial: EM paper #128

References

Andreas Schwill, **Fundamental Ideas of Computer Science,** Bulletin of the EATCS 53, 01/1994

Ira Diethelm, P Hubwieser, R Klaus, 2012. Students, Teachers and Phenomena: Educational Reconstruction for Computer Science Education, Koli Calling '12, ACM, NY

EM paper references 1

- Social demands
  - Realising sw development as a lived experience
  - Rethinking programming
- Science Content
  - EM paper #114
  - Lifelong learning
- Teachers' perspective
  - Constructionism discussions

EM paper references 2

- Students' perspective
  - CS405 empirical analysis
- Design & arrangement of CS lessons / courses
  - Progression of ideas from C5

Target learners …

- Computing specialists sympathetic to the idea that ideas broader than computational thinking are required

- Educators who wish to adapt/develop open online resources across disciplines

- Non-specialists who wish to understand the issues that surround the impact of code (cf. Code Acts in Education)

"Ability to develop a spreadsheet - baseline skill"