

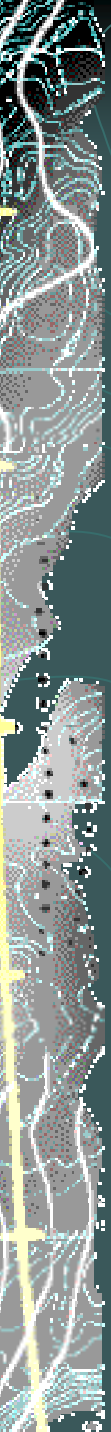


Finding a way forward: Plenary discussion

Russell Tytler

David Symington

Issues within science education



Issues within science education

Jonathan Osborne - the liberal perspective

Denis Goodrum

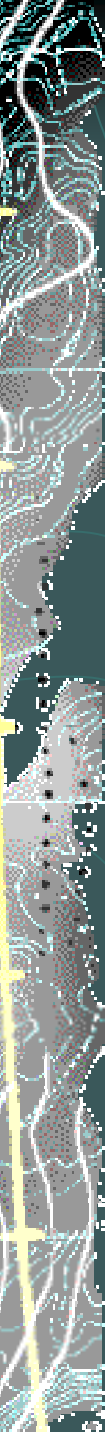
Rodger Bybee - BSCE and inquiry approach

Jim Davies - creativity and enterprise

Tytler & Symington - analytical thinking

Graham Foster-thinking skills

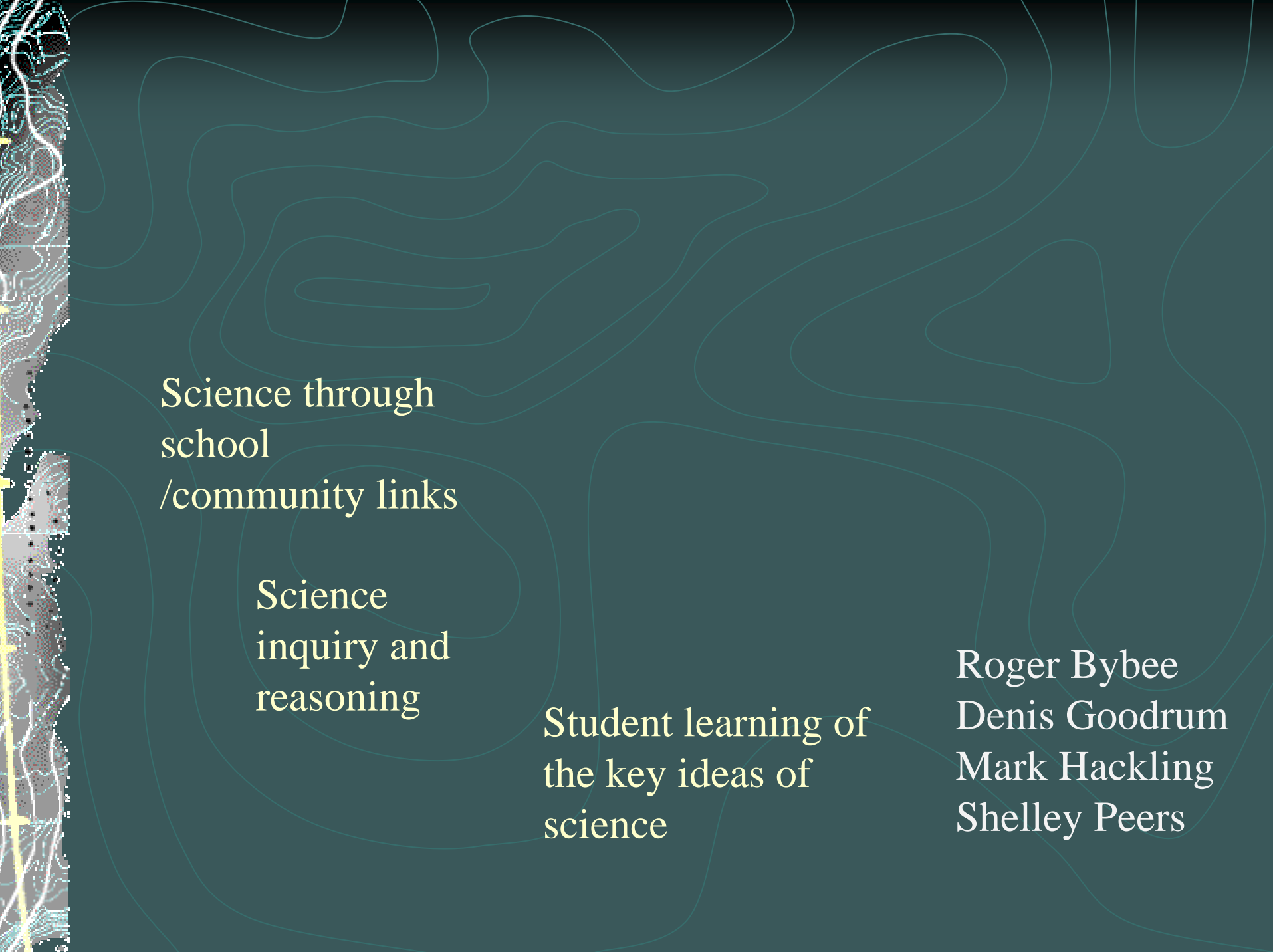
Science
inquiry and
reasoning



Science through
school
/community links

Science
inquiry and
reasoning

Leonie Rennie
ASISTM projects
Louisa Ivey - ESWA consortium
Jim Davies
Ruth Targett & Kate Anderson - science
mentors



Science through
school
/community links

Science
inquiry and
reasoning

Student learning of
the key ideas of
science

Roger Bybee
Denis Goodrum
Mark Hackling
Shelley Peers



Tytler & Symington

ESWA

Jim Davies

Anne Osman

Carter & Clarkson

Contemporary

practice of

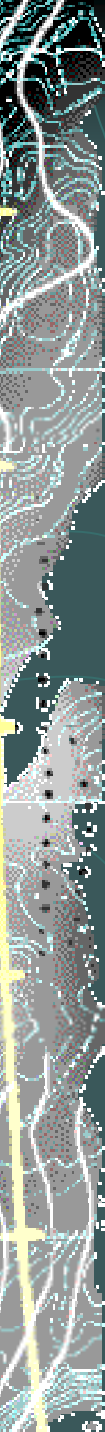
science

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Values, affective
responses as part
of key purposes

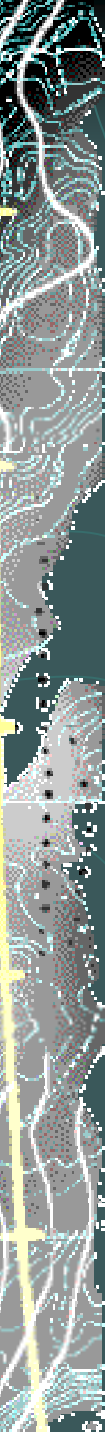
Contemporary
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Deb Corrigan
Peter Fensham
Tytler & Symington
Kurup & Hackling

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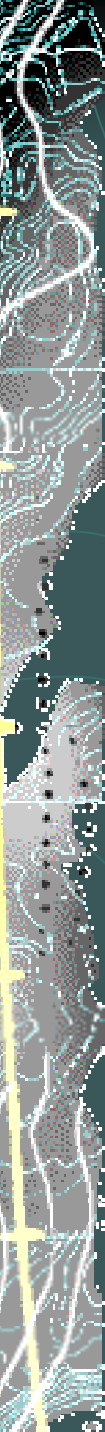
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schooling

Jim Davies
Leonie Rennie



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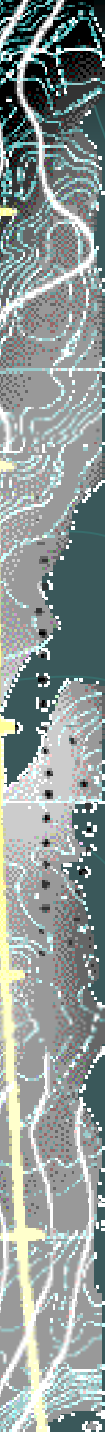
Science education
as a humanistic
enterprise

Peter Fensham
Deb Corrigan
Jonathan
Osborne

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Students' lives
and interests

Papers dealing with context

Re imagining Science Education:

Values, affective responses as part of key purposes

Contemporary practice of science

Science through school /community links

Science education as a humanistic enterprise

Science inquiry and reasoning

Student learning of the key ideas of science

Rethinking schooling

Students' lives and interests

Teacher forums: new directions

- Open ended projects related to real life issues valuing creativity, solar car. Curriculum is untied - all units are of relevance to students lives eg science and art pigments solvents etc. Units give choice so students own topic,
- Real life examples, build on prior knowledge, students can help teachers
- Science of sport look at interpreting the intent of the syllabus and depend less on text book.
- Ask students before choose contexts, use contemporary science issues
- Winemaking unit involving partnership with local industry
- More debate, research in classroom, interdisciplinary, debate on a deep level;
- Develop skills in students on researching issues; courses too content prescribed, should be issue based.

Teacher forums: curriculum constraints

- Prescriptive nature of curriculum prevents innovation.
- Topics in media can deal with at the time if curriculum less rigid;
- Freedom of choice at 7-10 but 11-12 much more prescribed. In 7-10 choices are made so it's more relevant.
- 7-10 indigenous pupils and disadvantaged so must rewrite courses for students. Much of syllabus irrelevant.
- HSC assessment drives curriculum
- Need to increase ability to design local programs at 11 and 12
- Need to contextualise learning. Move away from the prescribed syllabus
- Open curriculum may cause problems with less motivated

Proposition 1

- We need to re-imagine science education, accepting a shift that is occurring and must occur in the way we think of its nature and purposes
- Implication: *Any moves towards a national agenda for science education (curriculum and assessment) need to be premised on this re-imagining rather than refinement*

Forum: Assessment and status issues

- Engaging students in science across the curriculum, events in local community, problems with assessment and making assessment valued.
- Science in context, multidisciplinary approach eg senior science NSW but not valued for uni courses.
- Conservatism of staff in schools; parents conservatism;
- University staff attitudes, training undergrads for narrow discipline knowledge. Not enough process so students come into schools with narrow view of science.
- Parents are conservative in their views. Our role is to educate them;
- Academic scientists on panels for assessment and curriculum resist change; need to broaden approach to setting assessment tasks;
- Issue also for media, business and industry; cultural change also needed here

Proposition 2

- To achieve this re-imagined science education we need to develop:
 - A new metaphor for science education that will capture it's nature; and
 - Rigorous assessment processes appropriate to this re-imagined science education.



Implications for the teacher

- A number of presentations (Rodrigues, Ingvarrson & Semple, Harris) have dealt with teacher standards, teacher professional learning, teacher knowledge and beliefs.
- The many innovative projects and directions described at this conference require new pedagogies, knowledge, and commitments of science teachers.

Forum: teacher education

- Where to exert pressure: teacher training.
- Want engaging and dynamic teachers so training important.
- Negative effects of school training experience for learner teachers. Needs culture change in schools
- Many teachers want to change so structures for upgrading would be taken up
- Way we work as teachers; sec teachers isolated so must work in groups;
- Teachers need to be supported to take risks;
- Kuala Lumpur experience where teachers were encouraged to take risks so more students took science. Principal of school and curriculum coord etc all had same attitude;

Proposition 3

- There needs to be a national teacher education agenda focusing on re-imagining the role of the science teacher and developing teachers' capabilities (knowledge, pedagogy, disposition) that enable the support of the new directions.

Proposition for the conference:

- The time has come for a significant re-imagining of school science in Australia
 - Strongly agree
 - Agree
 - Unsure
 - Disagree
 - Strongly disagree