Students' Reasoning about Sustainable Development in Relation to Products' Life Cycles

Maria Sundler and Ellinor Hultmark

Background

Production and consumption are part of a complex socio-technological system

Education and knowledge about this complex system are required in the pursuit of **sustainable development**

In technology education, students can get the opportunity to **reason about products and their life cycles**

Research questions

1. What emerges in students' **reasoning about products' life cycles** in relation to the **social**, **ecological** and **economic** dimensions of sustainable development?

2. How are the **dimensions connected** in the students' reasoning?

Theoretical framework

- Toulmin's Argument Pattern: Claim, grounds, backing and rebuttals (Adapted from Erduran et al. (2004))
- Social, environmental, economical sustainable development (CSD report, 2001)
- Product life cycle: Production, Transportation, Usage & Maintenance and Disposal (Adapted from Vaesen (2012))

Methods

Data collection

- 2 focus group interviews (3-4 participants)
- Open questions related to the product life cycle

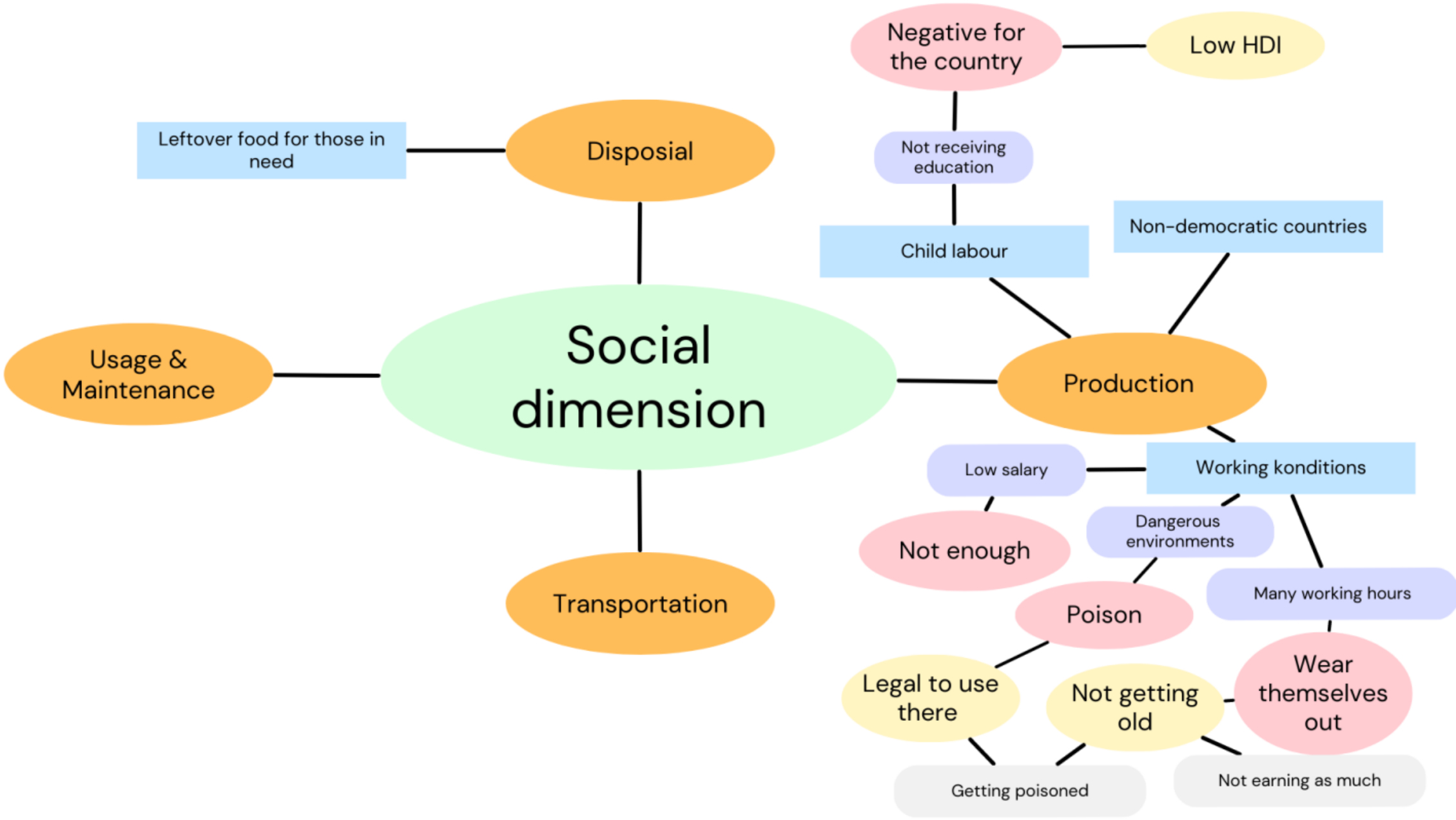
  For example: “What do you know about the production of things like clothes and footballs or mobile phones?”

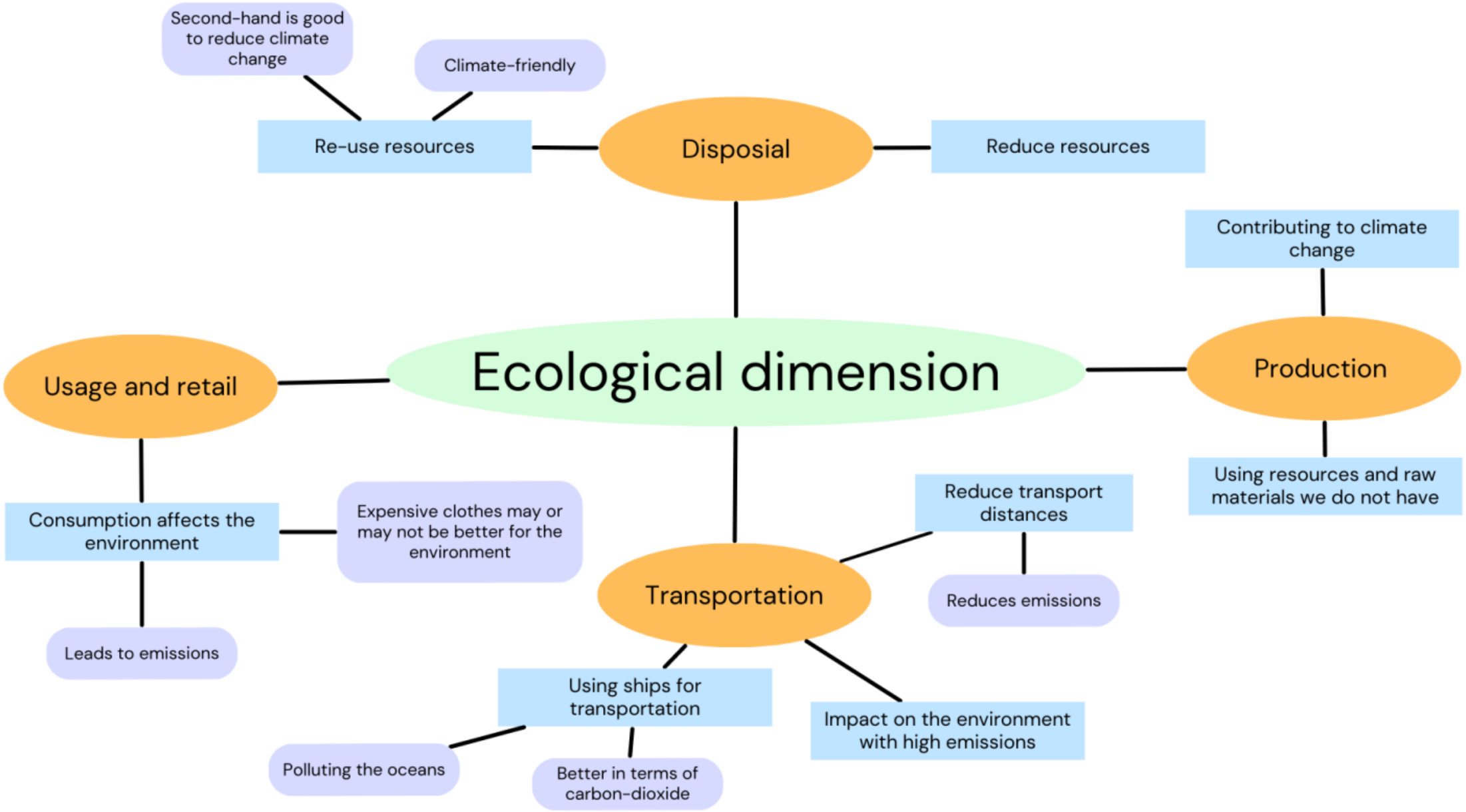
Data analysis

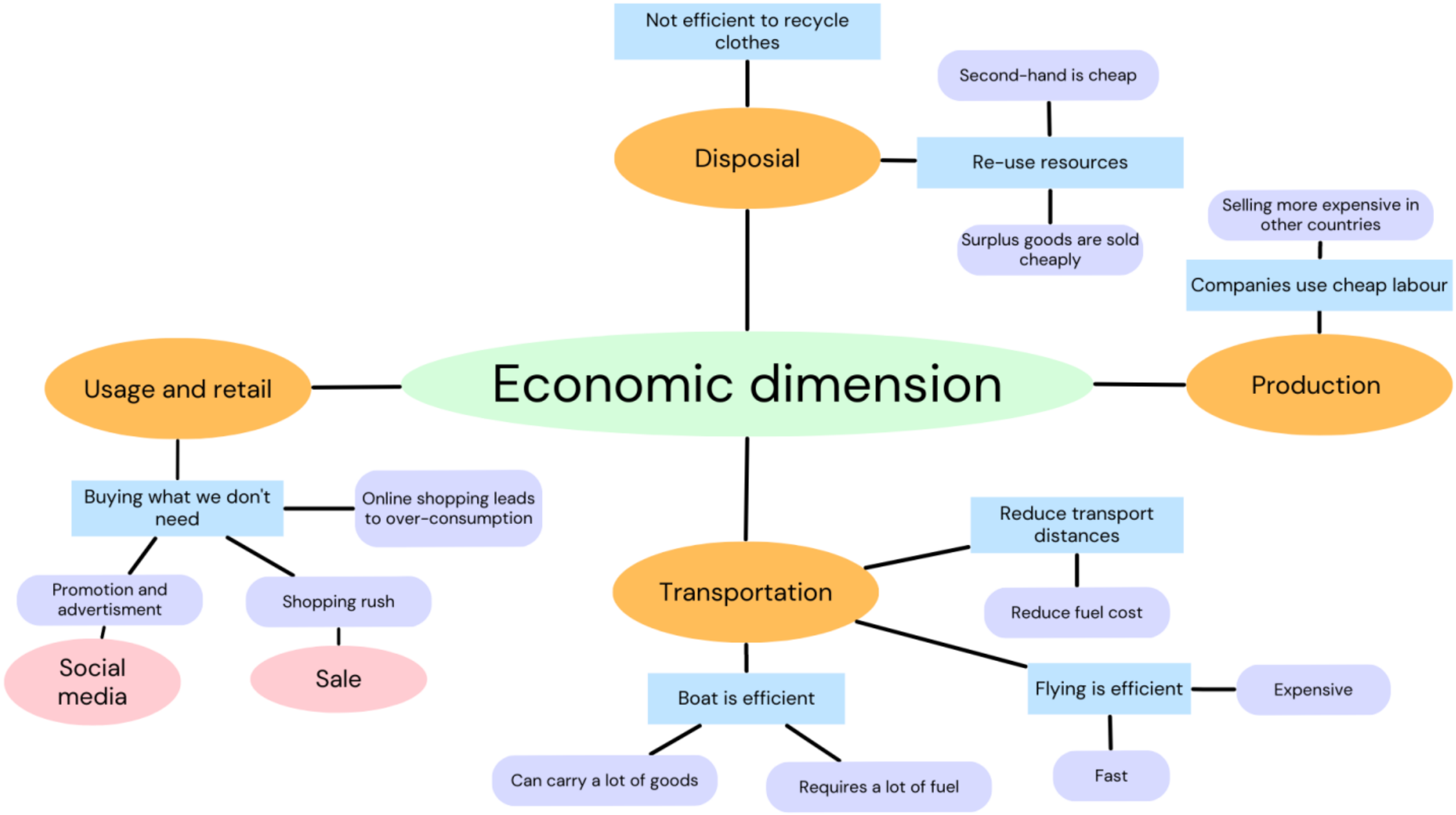
- Thematic analysis
  - Audio-recorded interviews transcribed
  - Deductive and inductive coding
  - Constructing themes

Findings

1. What emerges in students' **reasoning about products' life cycles** in relation to the **social**, **ecological** and **economic** dimensions of sustainable development?


Social dimension
Disposial
Leftover food for those in need
Usage & Maintenance
Transportation
Production
Negative for the country
Low HDI
Not receiving education
Child labour
Non-democratic countries
Low salary
Working konditions
Not enough
Dangerous environments
Poison
Many working hours
Legal to use there
Not getting old
Wear themselves out
Getting poisoned
Not earning as much

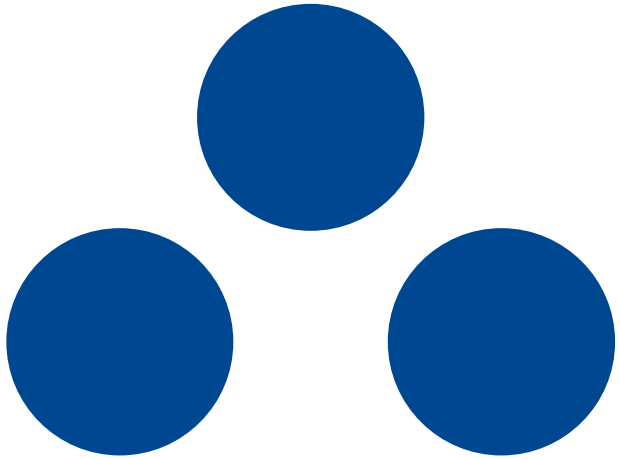

Ecological dimension
Disposial
Second-hand is good to reduce climate change
Climate-friendly
Re-use resources
Reduce resources
Production
Contributing to climate change
Using resources and raw materials we do not have
Usage and retail
Consumption affects the environment
Expensive clothes may or may not be better for the environment
Leads to emissions
Transportation
Reduce transport distances
Reduces emissions
Using ships for transportation
Polluting the oceans
Better in terms of carbon-dioxide
Impact on the environment with high emissions


Not efficient to recycle clothes
Second-hand is cheap
Disposial
Re-use resources
Surplus goods are sold cheaply
Selling more expensive in other countries
Companies use cheap labour
Usage and retail
Economic dimension
Production
Buying what we don't need
Online shopping leads to over-consumption
Promotion and advertisment
Shopping rush
Social media
Sale
Reduce transport distances
Transportation
Reduce fuel cost
Boat is efficient
Flying is efficient
Expensive
Can carry a lot of goods
Requires a lot of fuel
Fast

Findings

2. How are the **dimensions connected** in the students' reasoning?

- The Dimensions are **Isolated**
- The Dimensions **Harmonise**
- The Dimensions are **Contrasted**



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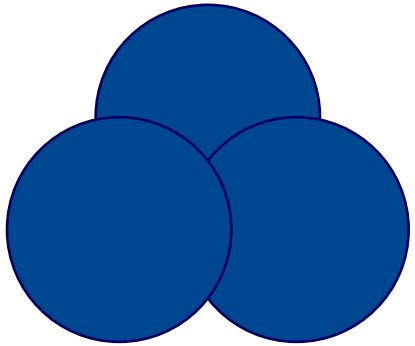

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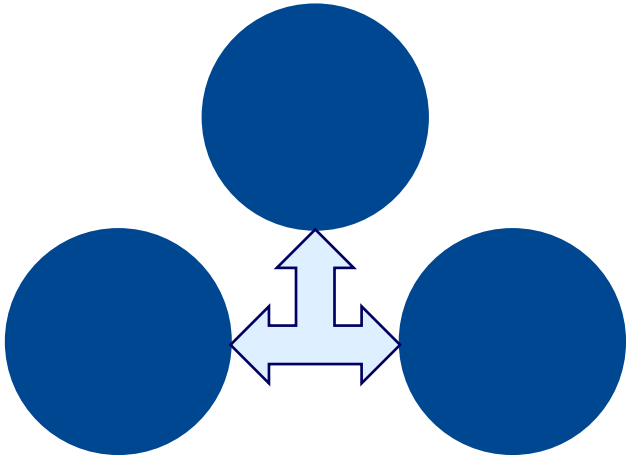
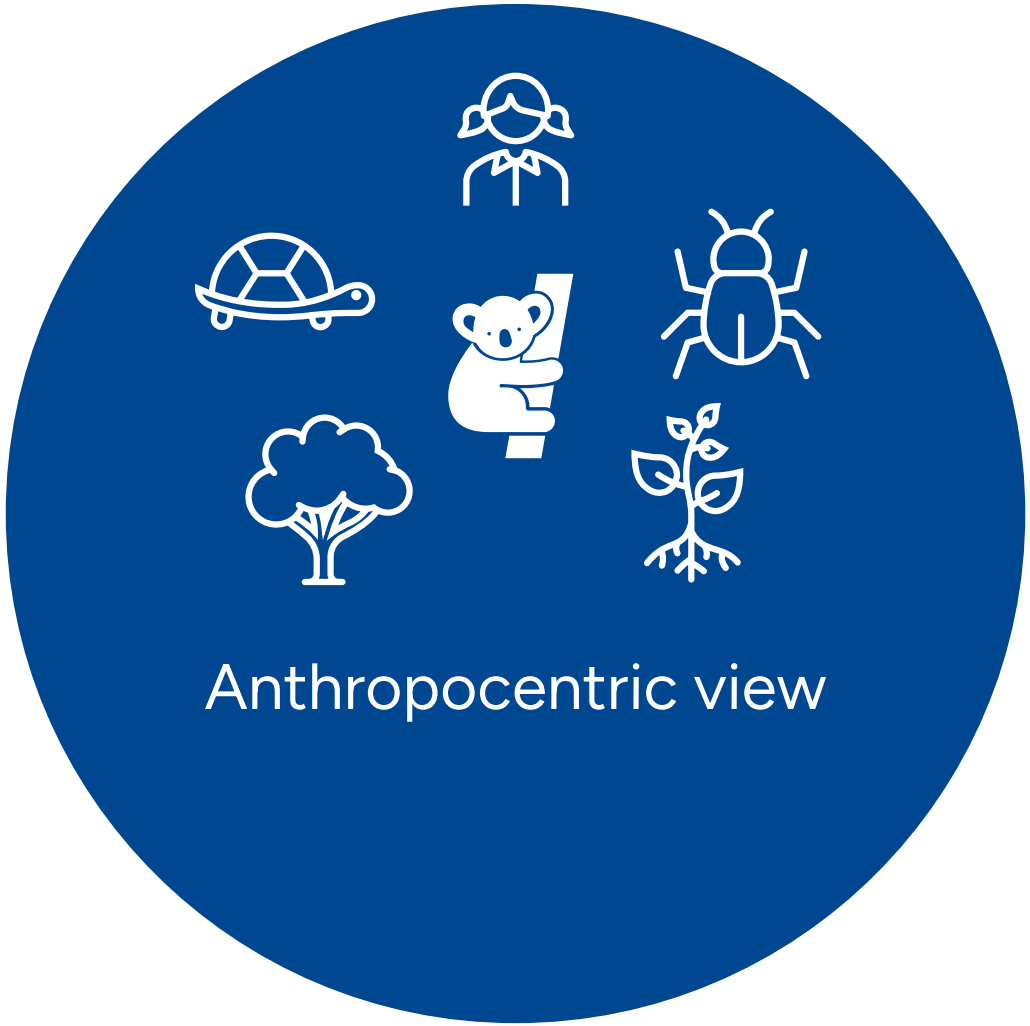
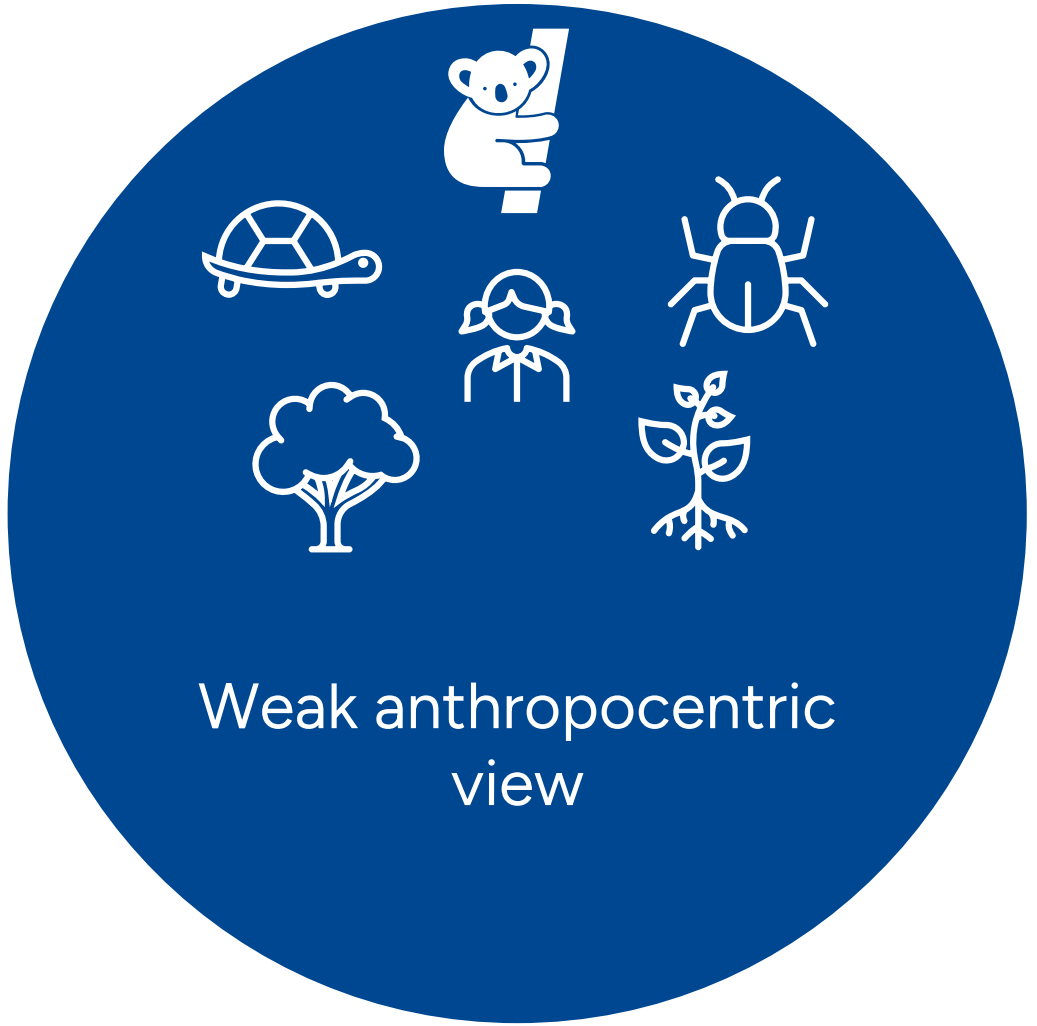


Conclusions and discussion

- The students reason deeply regarding social dimension linked to production
- Dimensions both harmonise and are contrasted
- Focus on the human perspective

Conslusions and discussion





We look forward to your comments and questions!

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