Willkommen,
Gaidīts, Welcome!

Teacher Training material

This project has been funded with support from the European Commission (Erasmus+). The document reflects the views only of the MetESD team and the Commission cannot be held responsible for any use which may be made of the information contained therein.

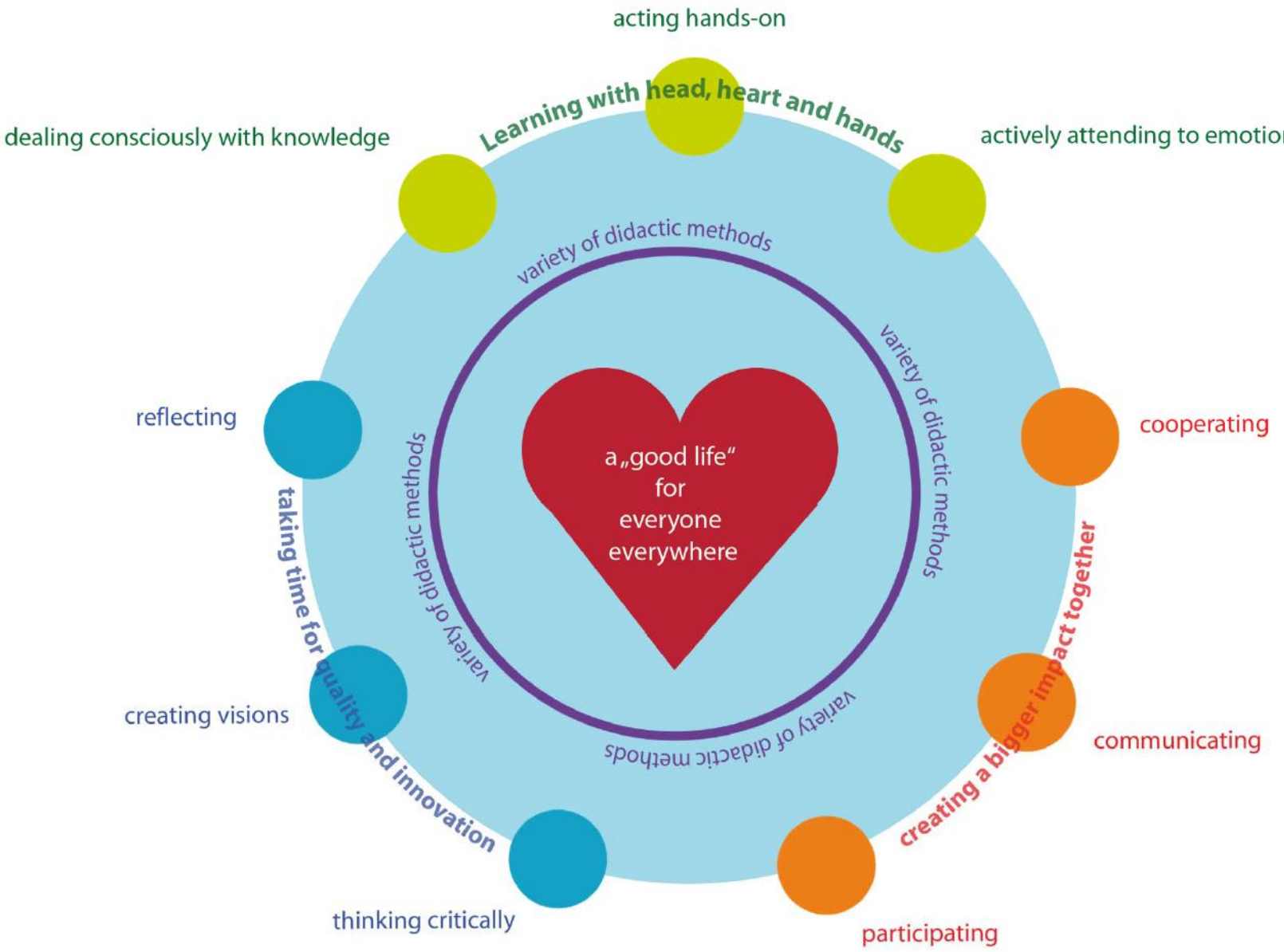
MetESD

Methods for Education for sustainable development (ESD) competencies and curricula

Introduction

Education for Sustainable Development - ESD

A Model for Education for Sustainable Development



forum umwelt bildung
für nachhaltige entwicklung

MetESD

Methods for
Education for sustainable development (ESD)
competencies and curricula

Module I

Systems Thinking Skills

Action Learning

- Experiential Learning

Inquiry-based learning

- Citicen Science
- Critical Thinking

Systems Thinking

- **Contexts**
  - Engineering
  - Management / Governance
  - Biology / Ecosystems
  - Geosystems (5_Spheres)
- **People**
  - Forrester
  - Meadows / Senge / Scharmer
  - Varela
  - Wasdell / IPCC

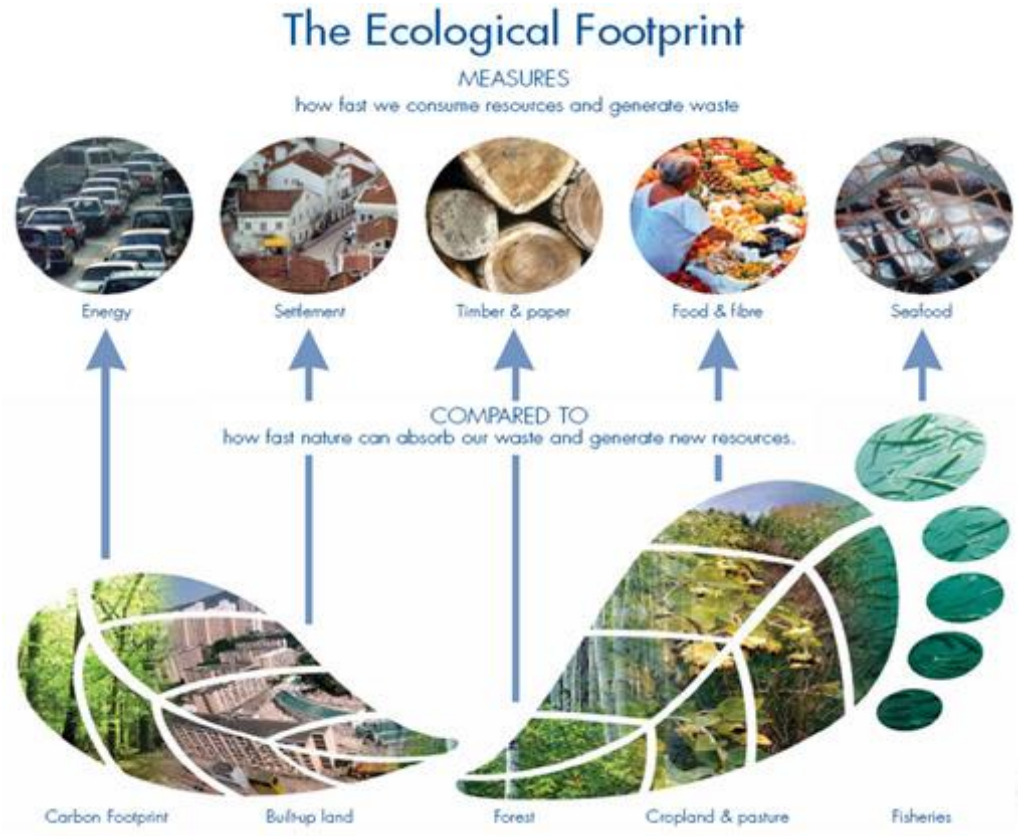
Ecological Footprint

Wir hinterlassen einen gewaltigen Eindruck.

- **5 Areas:**

1) **Energy**
2) **Settlement**
3) **Timber & Paper**
4) **Food & Fibre**
5) **Seafood**

- http://www.footprintnetwork.org/en/index.php/GFN/page/calculators/


The Ecological Footprint
MEASURES
how fast we consume resources and generate waste
Energy
Settlement
Timber & paper
Food & fibre
Seafood
COMPARED TO
how fast nature can absorb our waste and generate new resources.
Carbon Footprint
Built-up land
Forest
Cropland & pasture
Fisheries

Action Learning & Systems Thinking

- **Group Juggle** and the System's Alphabet
- **Islands** – the worlds in our heads: Mental Maps

- Some small pieces: Paper fold, Arms crossed, Circles in the Air, Ecological Footprint

- *To be experienced and discussed in **Friesoythe***

Group Juggle and the System's Alphabet

- Some physical exercise
- Teambuilding

- **Goal:** Keep as many balls in the air at the same time as possible.

- Preliminary exercise in a circle:
  Establish a order of throwing and catching a ball. Stick to this order all the time!

Group Juggle

- GO!

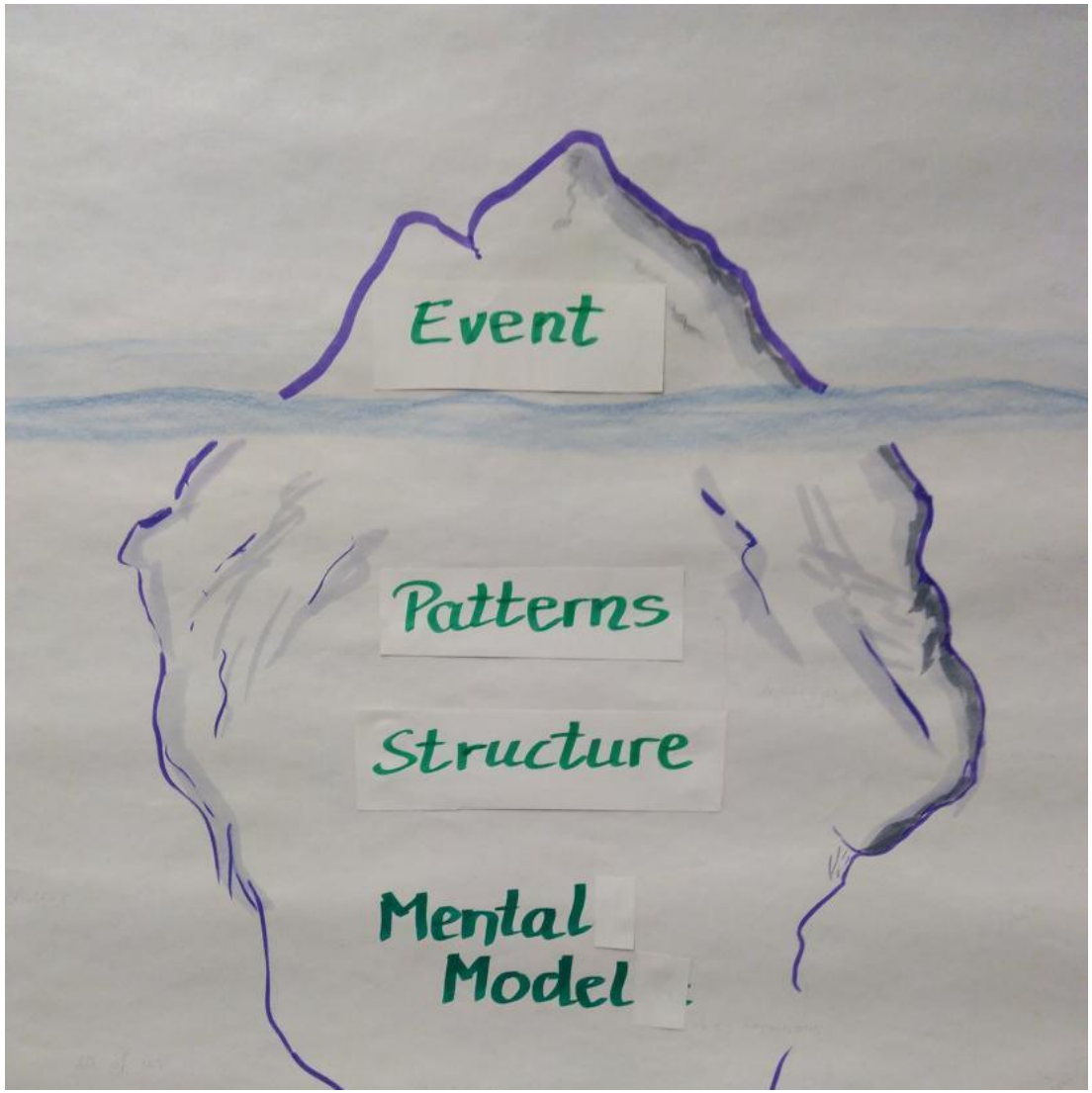
What happened?

- What have you noticed, what could you see?
  → Events
- How did you feel about that?

Action Learning + Systems Thinking

- Exploring systemic causes of behaviour
- **Icebergmodel**
- What lies below the waterline?

Action Learning + Systems Thinking

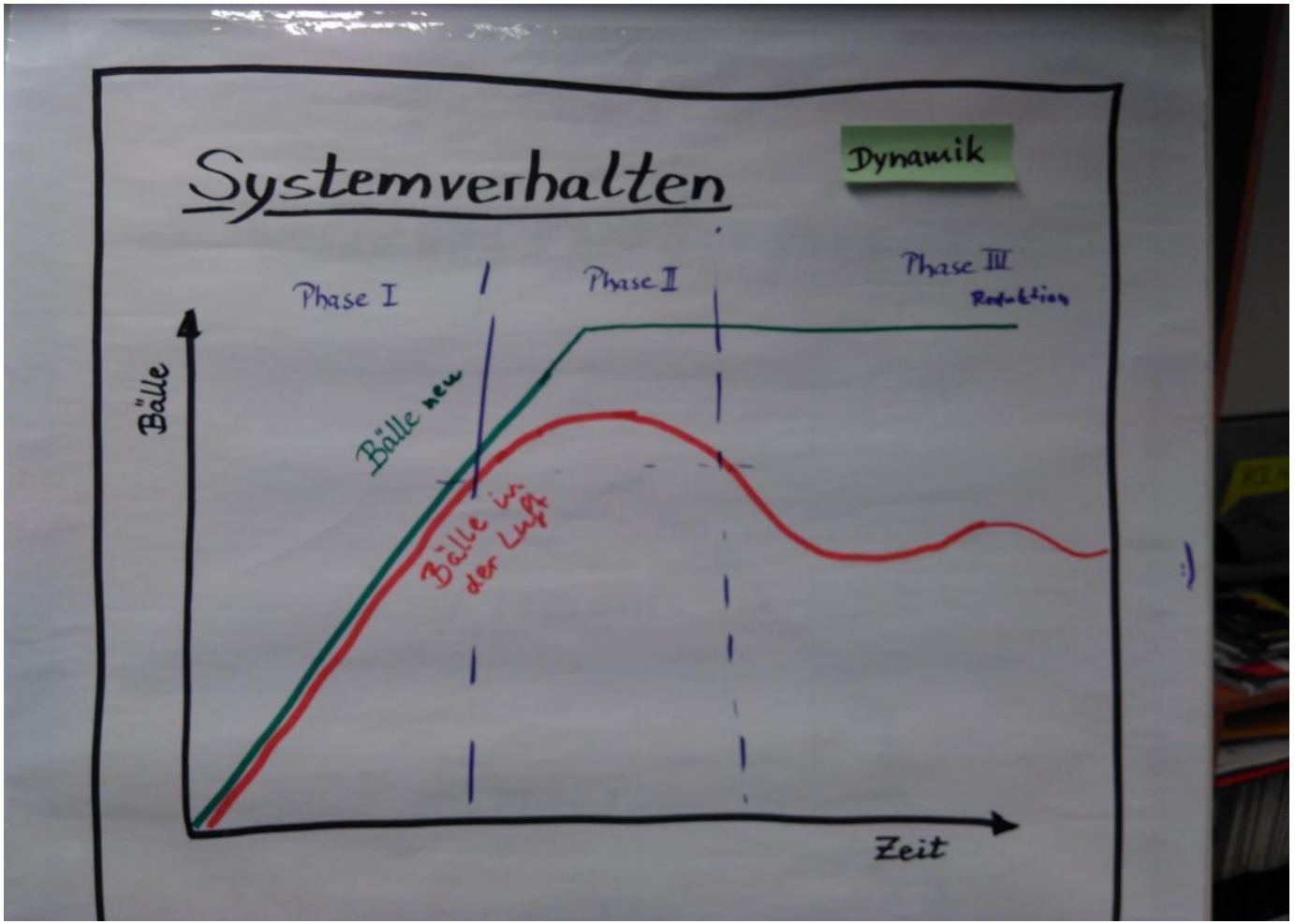


Did something change?

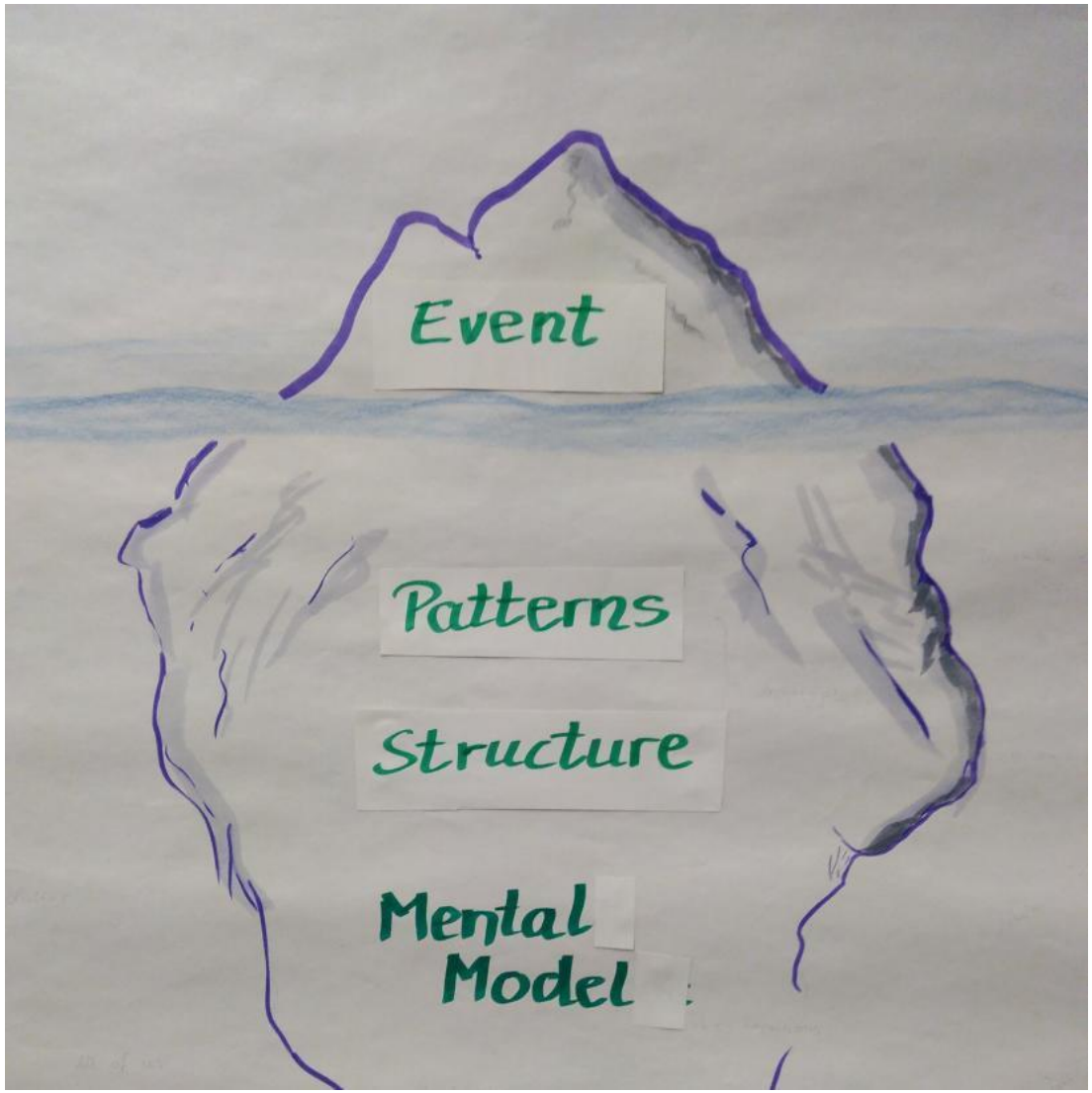
- What have you noticed, what could you see?

- How did you feel?

Behavior over time

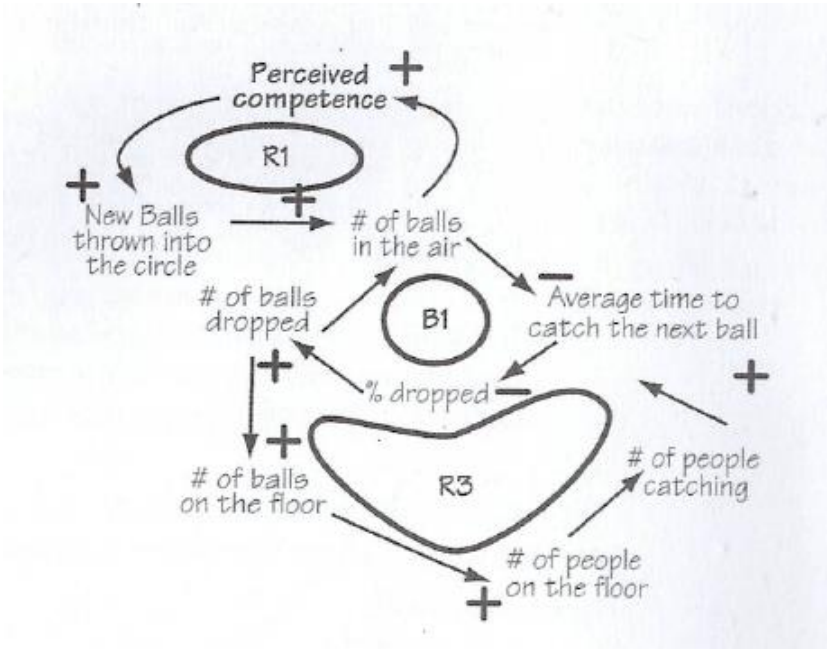


Action Learning + Systems Thinking



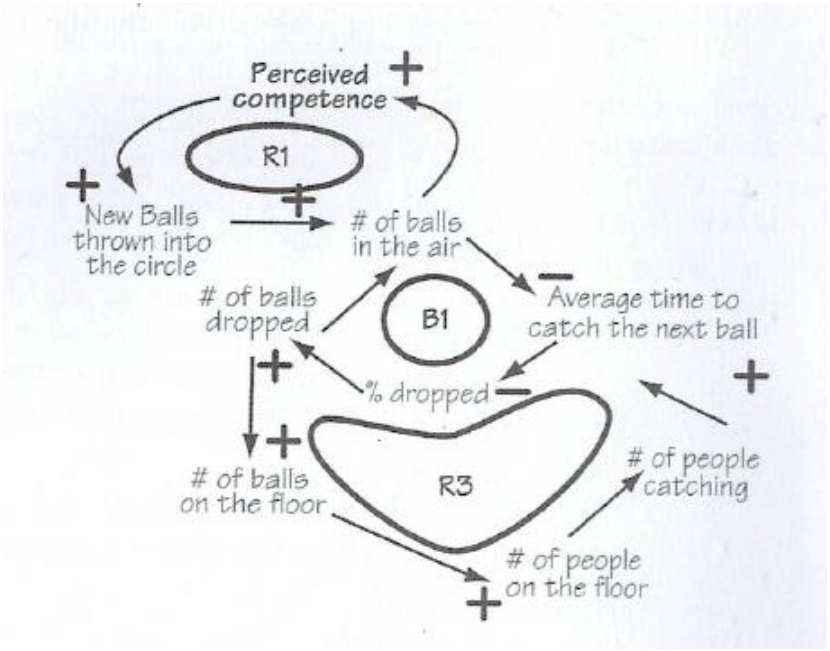
What drives behaviour?

- What were the causes of events and patterns?

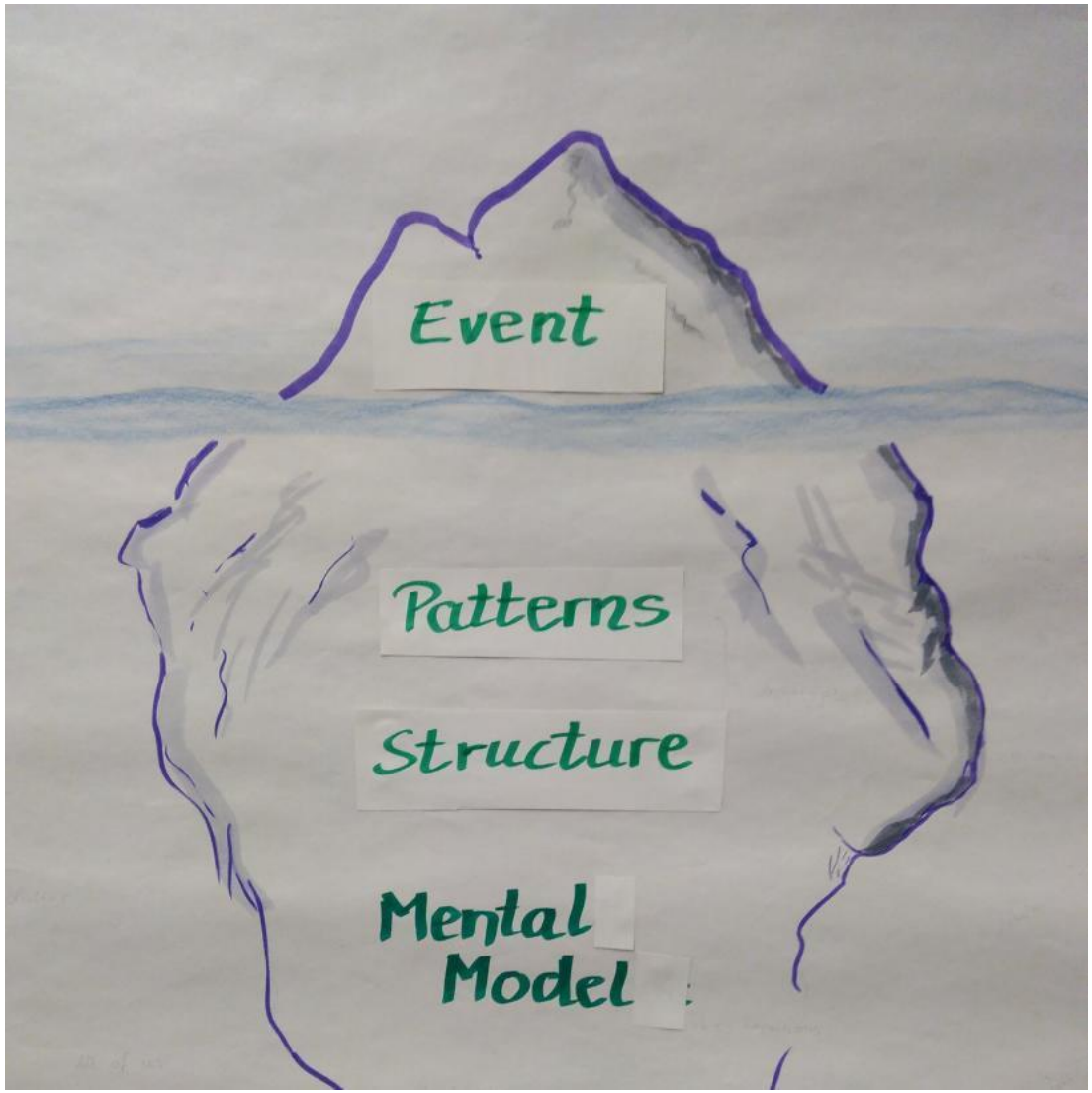


What drives behaviour?

- What were the causes of events and patterns?
- It's the **system's structure** stupid!



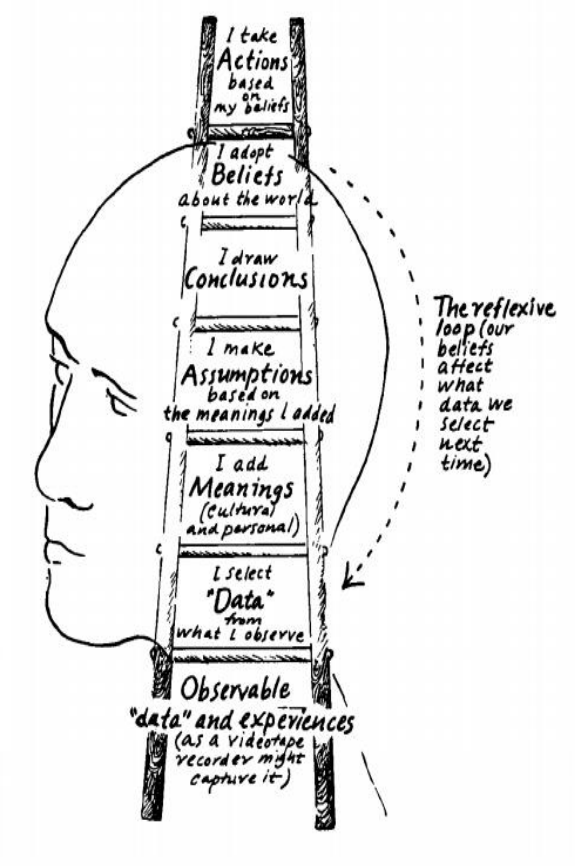
Action Learning + Systems Thinking



What makes change possible?

- **Mental Models**
- What's my interpretation?
- What's my worldview
- What are my values?

Ladder of Inference



Source: The Fifth Discipline by Peter Senge, 1994

- Actions
- Beliefs
- Conclusions
- Assumptions
- Meaning
- Data
- Experiences
- The Iceberg within us – the other way round

Ladder of Inference

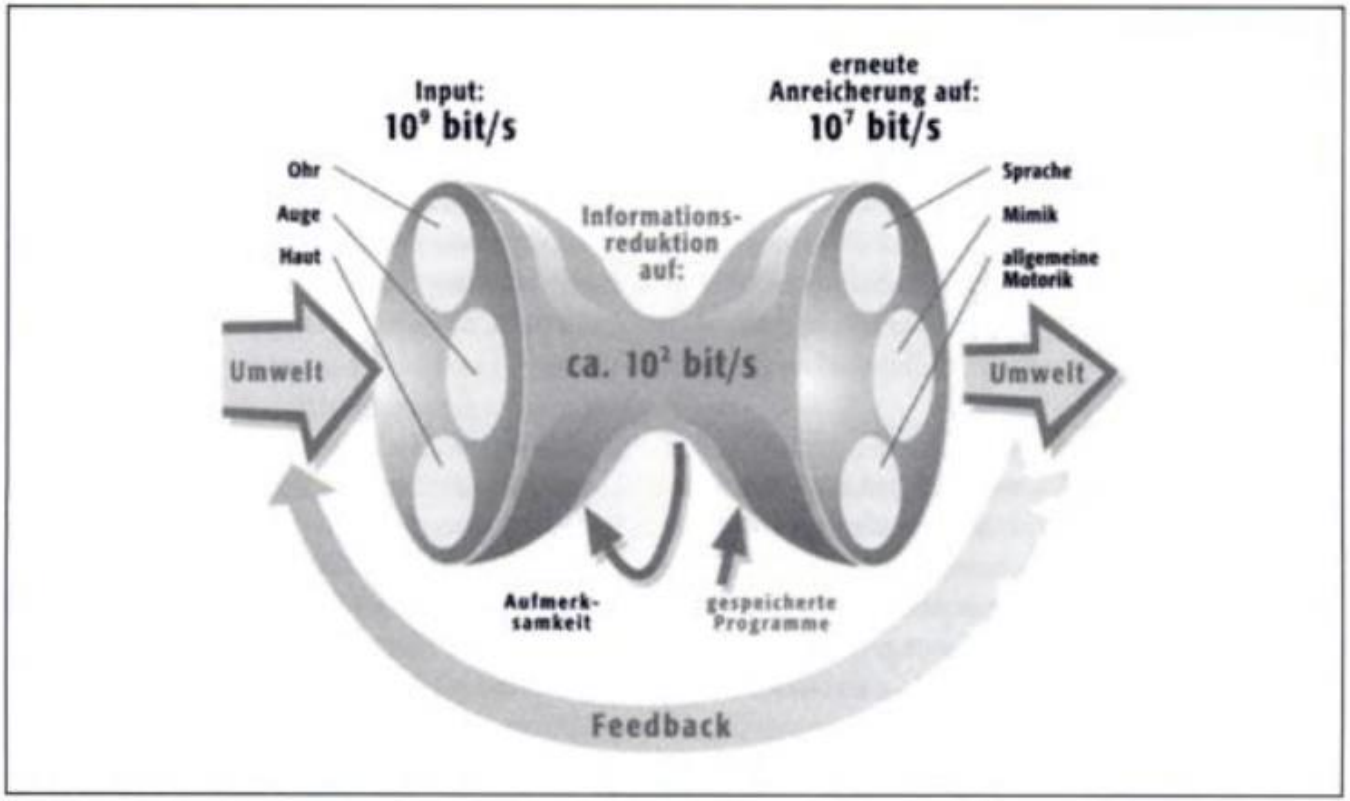
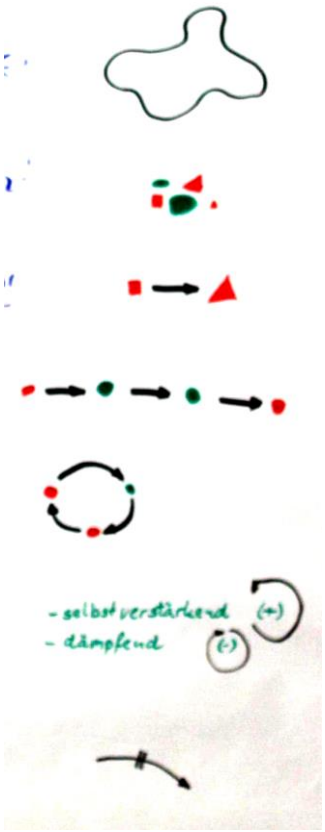


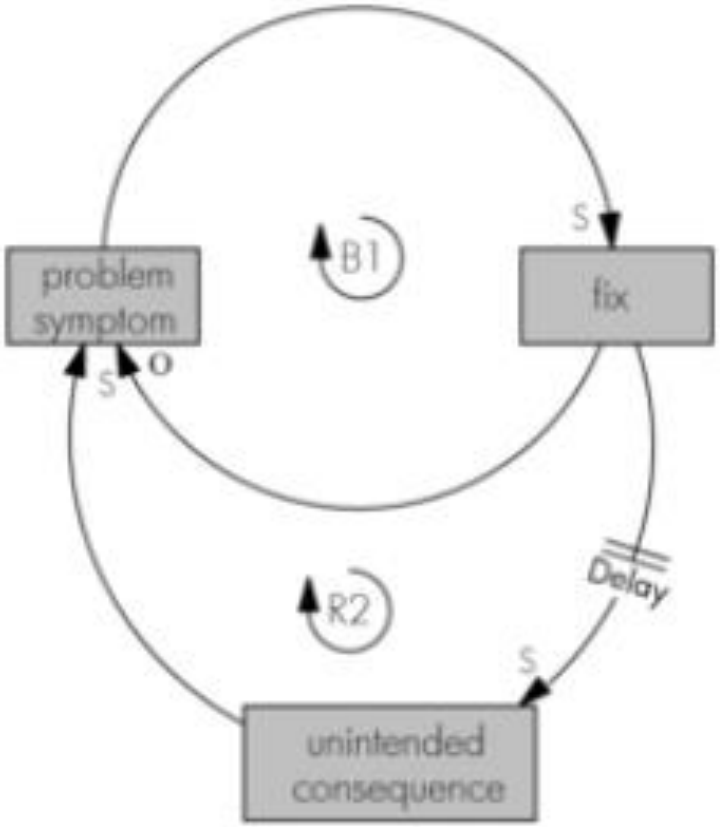
Abbildung 2-7: Das Flaschenhalsmodell der Datenreduktion nach VESTER[80]

The System's Alphabet

- **Elements of a System**
  - Border
  - Elements
  - Connections
  - Chain of connections
  - Loop(s) of connections
  - Type of Feedback (+/-)
  - Delay

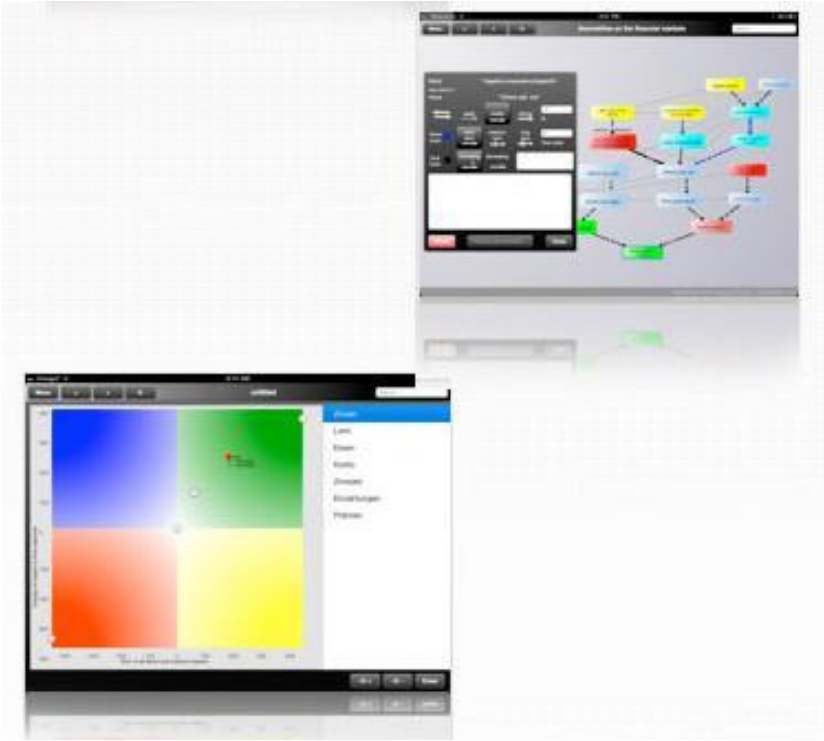


Writing Systems: CLD



- Causal Loop Diagrams
- Handling Complexity

Analysing Systems



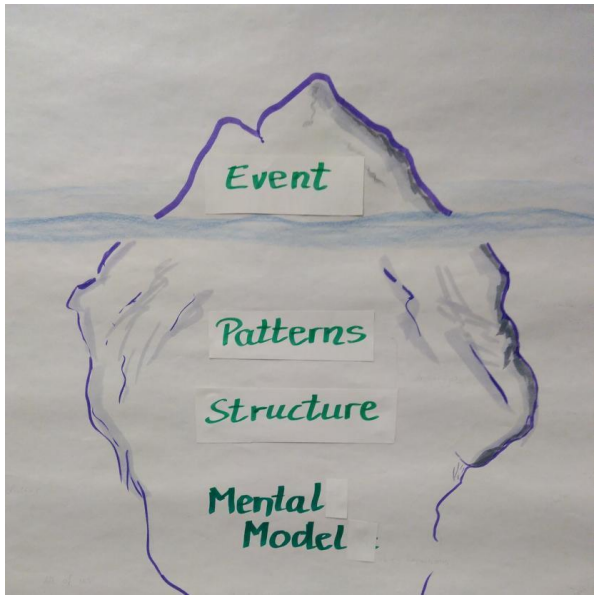
- Assistance in complex representations
- Conjoint assessment
- Visualize short- medium- long- term effects
- Project GenE

Islands – Mental Maps

- 3 Types of people
- 5 Teams
- 3 Tasks
- Unusual landscape
- Challenging Situations
- Fun

Islands – Mental Models

- The world(s) in our heads
- in the depth of the iceberg model



- The World:
  hostile or friendly?
- Myself:
  capable of coping or helpless?

Islands – Mental Models

- The world(s) in our heads
- in the depth of the iceberg model

- What about you?
- Can you get in touch with your … ?
- World
- Your Self
- Models of those

- How does it look like?
- Is it hostile or friendly?
- How do you feel?

  Capable of coping or helpless?

Islands – Mental Models

- The world(s) in our heads
- in the depth of the iceberg model

- Frederic Vester – Data reduction
  - Vester, Frederic (2007): *The Art of interconnected Thinking. Ideas and Tools for Tackling Complexity*, Mcb Verlag

- Peter Senge - Ladder of Inference
  - Senge, Peter (2012): *Schools that Learn: A Fifth Discipline Fieldbook for Educators, Parents, and Everyone Who Cares about Education,* Nicholas Brealey Publishing

- Donella Meadows - Leverage for change
  - Meadows, Donella H. (2008): *Thinking in Systems : A Primer*, Chelsea Green Publishing, Vermont

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Module II

Design Thinking / Sustainability
Entrepreneurship Skills

SUSTAINABILITY ENTREPRENEURSHIP

3 Main Dimensions

- **Sustainopreneurship consciously sets out to find and/or create innovations to solve sustainability-related problems**
- Poverty
- Water and sanitation
- Health
- Education/illiteracy
- Sustainable production and consumption patterns
- Climate change and energy systems
- Chemicals
- Urbanization
- Ecosystems, biological diversity and land use
- Utilization of sea resources
- Food and agriculture
- Trade justice
- Social stability, democracy and good governance'
- Peace and security

3 Main Dimensions

- **Sustainopreneurship means to get solutions to the market through creative organizing**

  see problems as opportunities

  entrepreneurial challenges

3 Main Dimensions

- **Sustainopreneurship in process adds sustainability value with respect for life support systems**

awareness that the (economic) market is an embedded subsystem in the „socio-phere“ that is in turn part of the „bio-sphere“

Sustainable vs. sustainability entrepreneurship

- Sustainable entrepreneurship:

  Generic entrepreneurial process

  Business idea in itself are not related to sustainability per se

- Sustainability entrepreneurship:

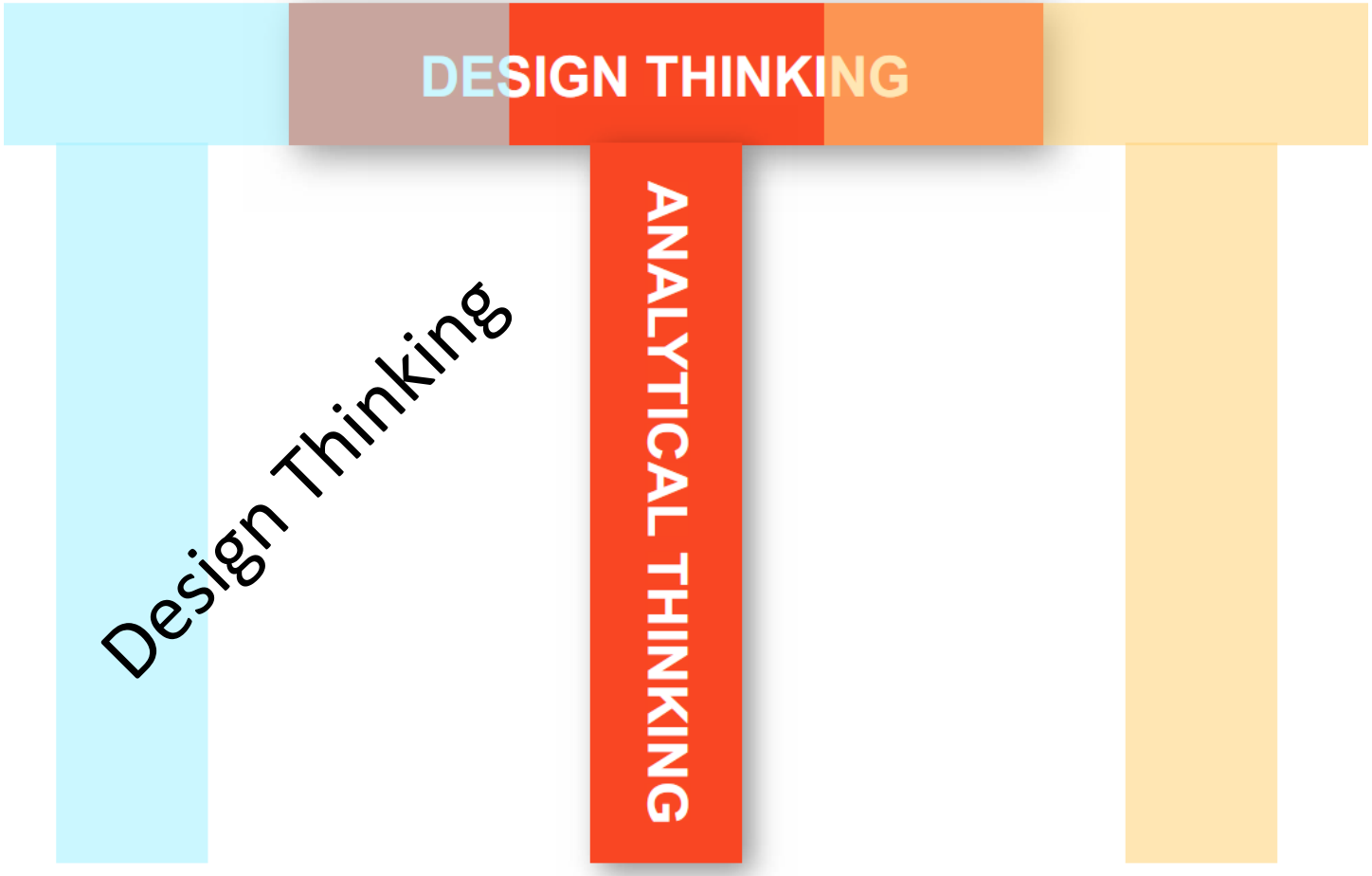
  Business with a cause

  To turn business activity from a part of the problem to a part of the solution

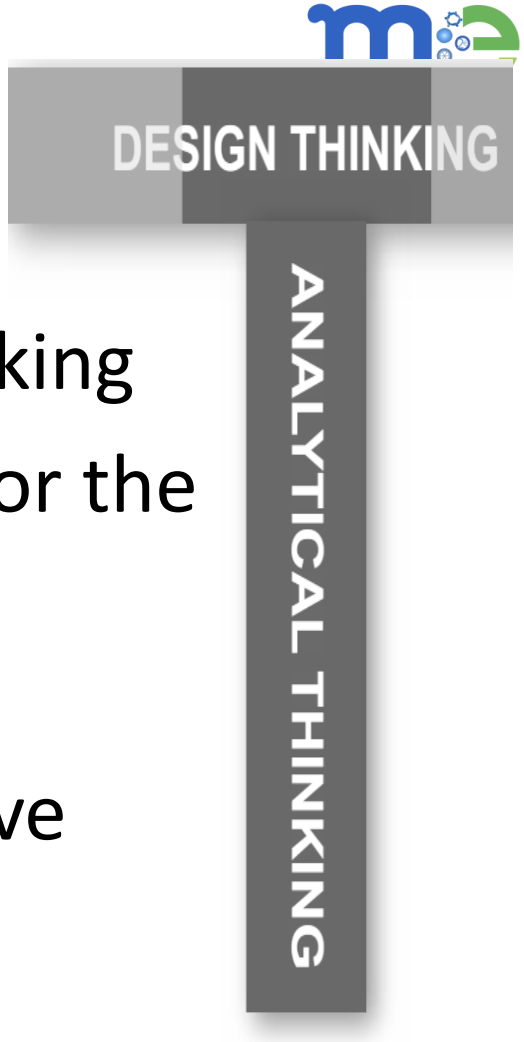
A method for sustainability entrepreneurship

DESIGN THINKING

creative solution finding



Background

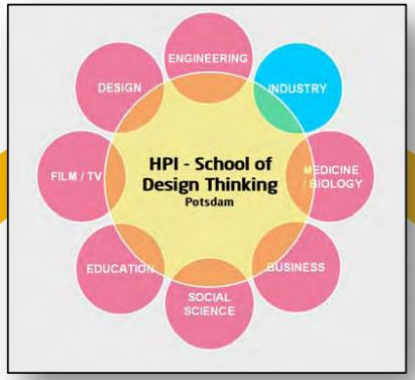


- Analytical Thinking vs. Design Thinking
- Design Thinking is a new method for the development of innovative ideas in all areas of live
- Design Thinking is a method to solve complex problems and to develop innovative ideas

Components of Design Thinking

Multidisziplinäre Teams

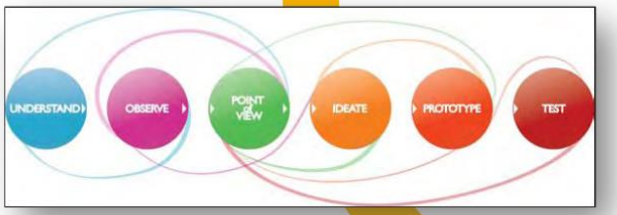
Multidisciplinary teams



Iterative process

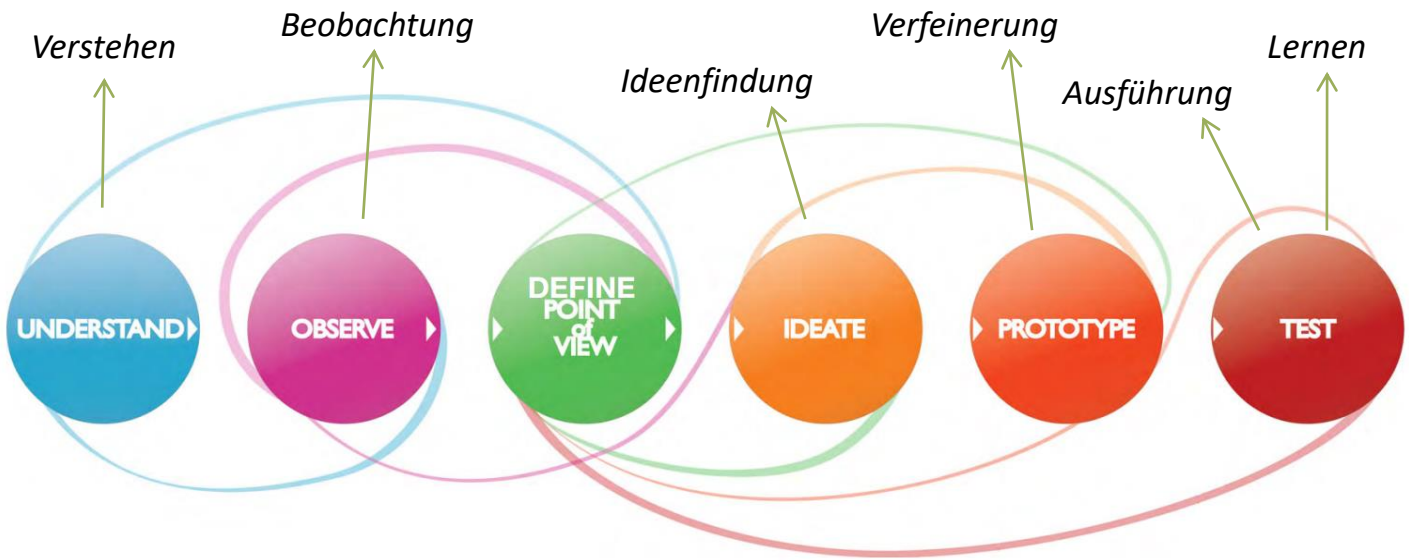
Variable spaces

Iterativer Prozess



Variabler Raum

Iterative process



Requirements

- Empathy
- Integrative thinking
- Optimism (At least one solution is better than the already existing one)
- Love of experimentation
- Capacity for teamwork

Further reading

- Design Thinking concept (https://en.wikipedia.org/wiki/Design_thinking)
- HPI: School of Design Thinking (https://hpi.de/en/school-of-design-thinking.html)
- "Design Thinking for Social Innovation" by Tim Brown & Jocely Wyatt, Stanford Social Innovation Review (https://ssir.org/articles/entry/design_thinking_for_social_innovation)
- Further literature to the method of Design Thinking (https://hpi.de/en/school-of-design-thinking/publikationen/recommended-literature.html)

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Module III

Values and Needs Biography – Non Violent Communication

VALUES EDUCATION AND NEEDS BIOGRAPHY

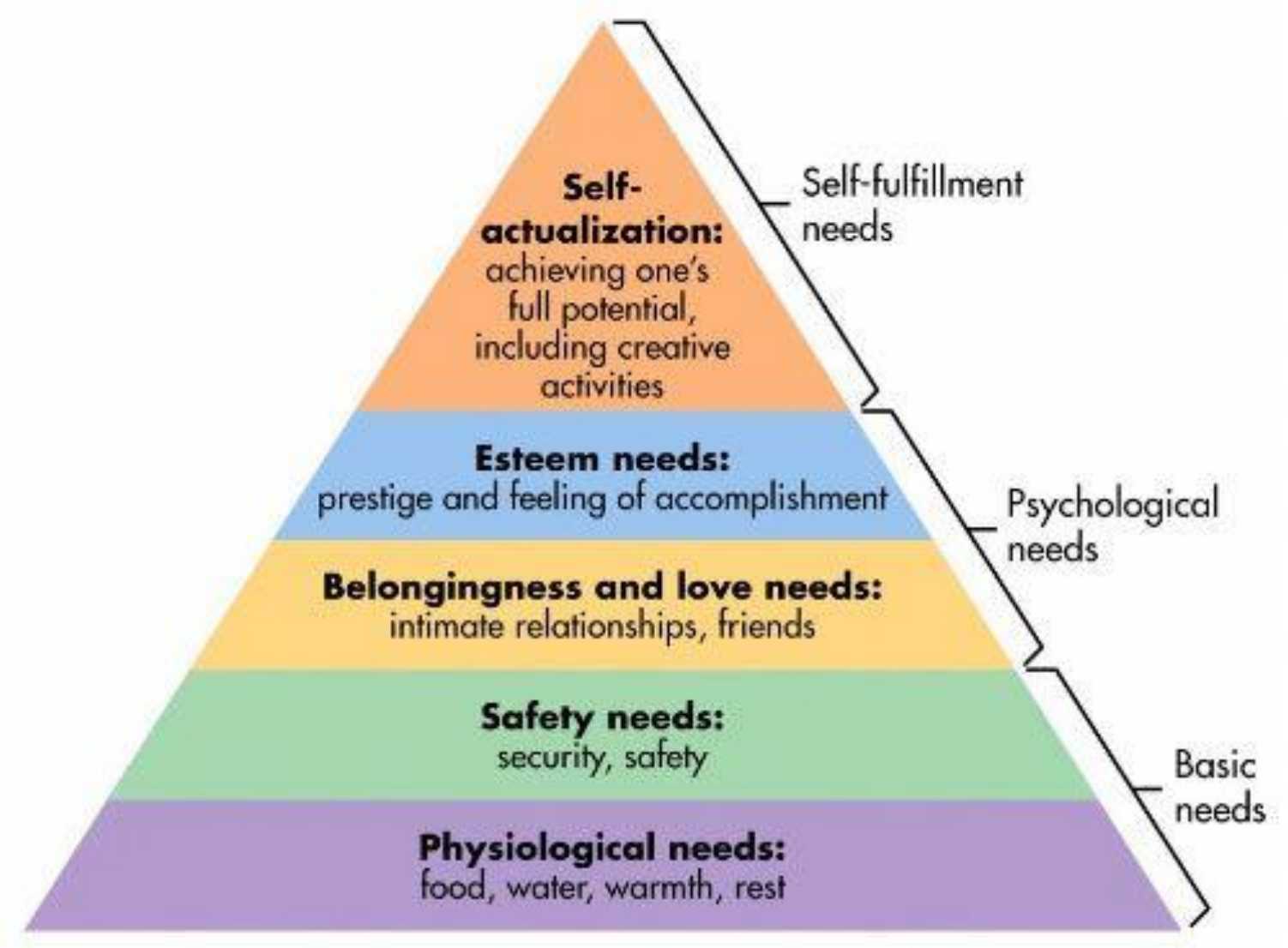
Agenda

- Values education
  - What values are important to us?
  - Shall we teach ESD as a value?
- Needs biography
  - Maslows pyramid
  - Max Neefs needs matrix
- 5 ways of wellbeing (NEF)

What are values?

- What values are important to us?
- What values are important to our students?
- ESD as a value?

Maslow‘s pyramid



Max Neef needs‘ matrix

Fundamental human needs	Being (qualities)	Having (things)	Doing (actions)	Interacting (settings)
subsistence	physical and mental health	food, shelter, work	feed, clothe, rest, work	living environment, social setting
protection	care, adaptability, autonomy	social security, health systems, work	cooperate, plan, take care of, help	social environment, dwelling
affection	respect, sense of humor, generosity, sensuality	friendships, family, relationships with nature	share, take care of, make love, express emotions	privacy, intimate spaces of togetherness
understanding	critical capacity, curiosity, intuition	literature, teachers, educational policies	analyze, study, meditate, investigate	schools, families, universities, communities
participation	receptiveness, dedication, sense of humor	responsibilities, duties, work, rights	cooperate, dissent, express opinions	associations, parties, churches, neighborhoods
leisure	imagination, tranquility, spontaneity	games, parties, peace of mind	daydream, remember, relax, have fun	landscapes, intimate spaces, places to be alone
creation	imagination, boldness, inventiveness, curiosity	abilities, skills work, techniques	invent, build, design, work, compose, interpret	spaces for expression, workshops, audiences
identity	sense of belonging, self-esteem, consistency	language, religions, work, customs, values, norms	get to know oneself, grow, commit oneself	places one belongs to, everyday setting
freedom	autonomy, passion, self-esteem, open-mindedness	equal rights	dissent, choose, run risks, develop awareness	anywhere

“The cultivation and expansion of needs is the antithesis of wisdom. It is also the antithesis of freedom and peace. Every increase in needs tends to increase one's dependence on outside forces over which one cannot have control, and therefore increases existential fear. Only by a reduction of needs can one promote a genuine reduction in those tensions which are the ultimate causes of strife and war.”

–E.F. Schumacher

5 Ways to Wellbeing

Values and needs

- How can we incorporate values and needs into our own teaching practices?
  - Get in pairs and think about applying this to your classroom
  - Create a scenario where you integrate this into your teaching practice and present this to the group

Further Links

- http://www.valuesbasededucation.com/resources.lessons.html
- http://www.curriculum.edu.au/values/val_lesson_plans_and_activities,15648.html

Based off the work of
Marshall Rosenberg Ph.D.

NONVIOLENT COMMUNICATION AND ITS USE IN THE CLASSROOM

Nonviolent Communication (NVC)

"A specific approach to communication—speaking and listening—that leads us to give from the heart, connecting us with ourselves and with each other in a way that allows our natural compassion to flourish"

–Marshall Rosenberg

Effects of NVC

- We are more aware of what we are perceiving, feeling and wanting.
- Our words become conscious and we are better able to express ourselves.
- We are able to specify behaviors and conditions that affect us.
- We are able to communicate concretely what we want and need.
- We are better able to listen and connect to others.
- Establishes a flow of communication.

Basic Assumptions

- Communication skills strengthen our ability to be human.
- We naturally know how to relate to one another.
- Culturally, we have the habits of defending, withdrawing, attacking, criticizing and resisting.
- Culturally, we focus our attention and communication in places where we are unlikely to get what we want.
- Giving from the heart enriches both the giver's life and that of the receiver.

There Are Two Parts to NVC

- Expressing Honestly
- Receiving Empathetically

The NVC Process: The Four Components

- Observations
- Feelings
- Needs
- Requests

Observations

- When we combine observation with evaluation, people often hear criticism.
- Concrete actions.
- Free of judgments.

Observation or Judgment?

- You seldom do what I want.
- Judgment. NVC: *The last three times I asked you to do an activity, you said you did not want to do it.*
- He frequently comes over.
- Judgment. NVC: *He came over three times last week.*
- When I see you give away your lunch money I feel that you are being too generous.
- *NVC!*

Feelings

- Specific feelings we experience when we observe this action.

Real Feelings

- Often we disguise other situations as feelings.
- Distinguish feelings from thoughts.
  - "I feel like you should know better."
- Distinguish what we feel and what we think we are.
  - "I feel inadequate."
- Distinguish what we feel and what we think others react.
  - "I feel unimportant."

Needs

- Connected with the feeling we have identified.

Basic Human Needs

- Autonomy
- Celebration
- Integrity
- Interdependence
- Play
- Spiritual Communion
- Physical Nurturance

Request

- Specific.
- What we need that would enrich our life.
- Uses Positive Language.
- Express appreciation when a listener tries to meet your request.
- Just expressing feelings leaves the listener unclear of what to do.
- Just expressing a request without sharing feelings and needs often sounds like a demand.

Example

- A mother comes homes and sees her son's dirty sox in the living room. She says: "Felix, when I see two balls of soiled sox under the coffee table, and another three next to the T.V., I feel irritated because I am needing more order in the rooms we share in common. Would you be willing to put your sox in your room, or in the washing machine?"

- Where are the four components?

The Four Components

- Observation—I see two balls of dirty sox under the coffee table and another three by the T.V.
- Feelings—I feel irritated.
- Needs—I need more order in the rooms we share in common.
- Request—Would you be willing to put them in your room or in the washing machine?

Receiving From Others The Same Four Pieces of Information

- The other aspect of communication.
- Connecting with others.
- Sensing what they are observing, feeling, needing and requesting.

Receiving with Empathy

- Empathy: “Emptying the mind and listening with our whole being.”

  -Marshall Rosenberg

Listening Empathetically

- Listen for the person's observations, feelings, needs and requests.
- When asking for information, first express our own feelings and needs.
- Ask permission to paraphrase what the person is saying.
- Ask permission before offering advice or reassurance.
- The speaker has received adequate empathy when we sense a release of tension, or the flow of words comes to a hault.
- Empathy involves focusing your full attention on the other person.

Common Responses That Block Empathy

- Advising
- Educating
- Consoling
- Story Telling
- Sympathizing
- Explaining

Buddhist Saying:

“Don’t just do something, stand there.”

Connection to Education: Marshall Rosenberg's Vision

"How quickly we contribute to students learning that the most important part of schooling is not the development of Life Enriching Skills and information, but earning positive judgments and avoiding negative ones."

-Marshall Rosenberg

Domination Schools vs. Life Enriching Schools

- Typical schools:
- Students work for external
- rewards or to avoid punishments.
- Comprised of “Power over” feelings where teachers know what is best.

- Life Enriching Schools:
- Students learn because they want to.
- Teachers and students are partners.

Mutual Objective Setting

- The most important part of education is choice.
- Objectives based on life enriching purposes.
- Objectives formed out of a dialogue between the student and teacher.

Evaluation

- Teachers use “I agree” “I disagree” statements versus “right” “wrong”.
- Students know independently when they have met the objective.
- Teacher evaluations are statements reflecting on student progress towards meeting the established goals versus traditional grades.

Creating a Learning Community

- Students respect one another.
- Students learn at their own rates and can teach each other.
- Use of community volunteers, resources and opportunities to promote student learning.

Tools to Teach Children NVC

The Compassionate Classroom By Sura Hart and Victoria Hodson

- Based off the principles of NVC.
- Contains numerous activities and games to teach children about the nature of giving and receiving and the language of NVC.

Jackal Language versus Giraffe Language

- Jackals:
- Label
- Judge
- Blame
- Deny
- Demand

- Giraffes:
- Use NVC language.
- State observations, feelings, needs and requests.
- Listen with empathy.

The Effects of Using NVC with Children in Classrooms

- Allows teachers and students to communicate more clearly.
- More likely that everyone will get their needs met.
- Reduces classroom conflicts.
- Promotes classroom community.

For More Information, Materials or Books:

- The Center for Nonviolent Communication

  www.cnvc.org

Resources

- *Rosenberg, Marshall B. (2003). Nonviolent Communication: A Language of Life. Puddledancer Press.*
- Rosenberg, Marshall B.; Riane Eisler (2003). *Life-Enriching Education: Nonviolent Communication Helps Schools Improve Performance, Reduce Conflict, and Enhance Relationships*. Puddledancer Press
- Hart, Sura; Victoria Kindle Hodson (2004). *The Compassionate Classroom: Relationship Based Teaching and Learning*. Puddledancer Press.

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Module IV

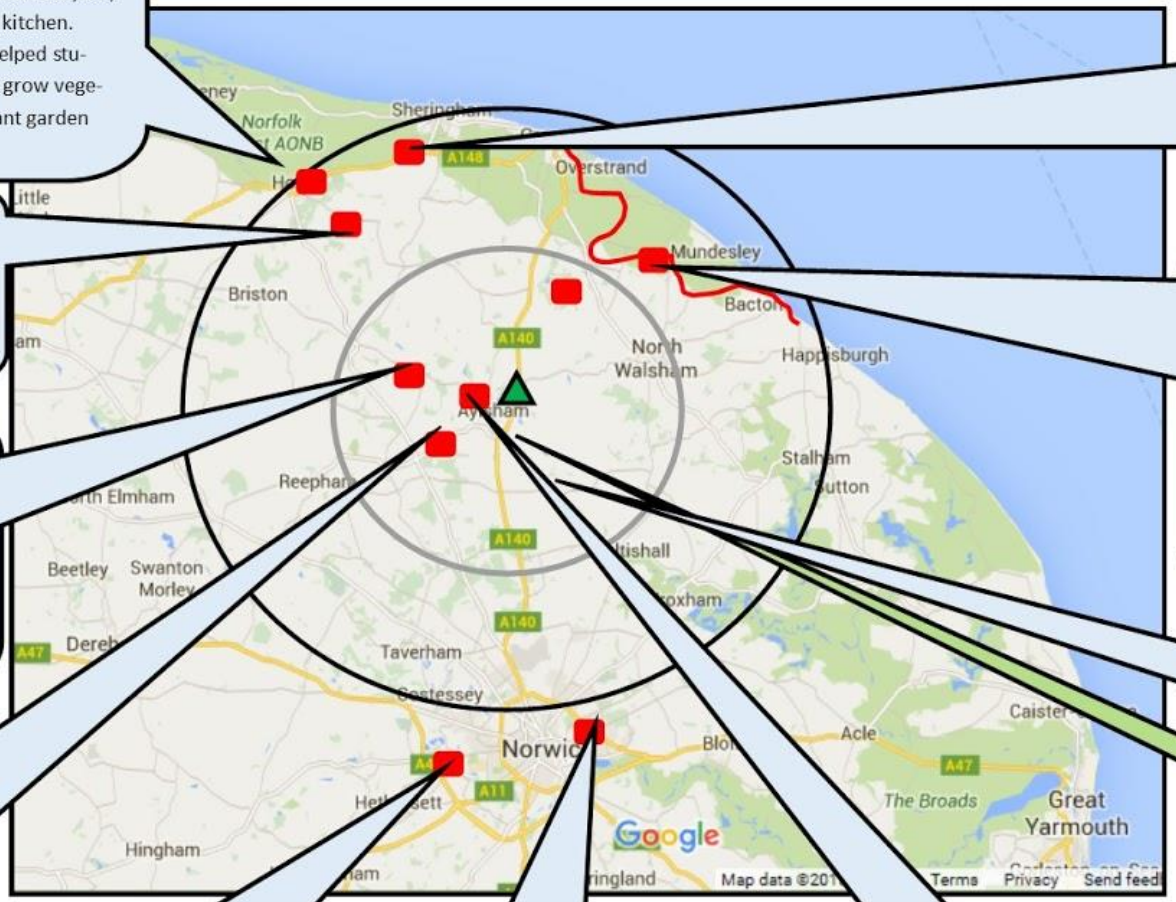
Play the game - walk the talk

Mapping the regional profile

- In your region: think of the school and the potential partners that you could interlink with and create a potential project, working with industry/companies together

Map of Outdoor Learning Providers in North Norfolk

December 2014



Holt Hall Outdoor Centre NCC: pupils working alongside estate team – horticultural tasks (maintaining the walled garden) and learning more about forestry / trees. In the previous year, also helped prepare food in the Hall kitchen. Gardener also came to school and helped students construct a keyhole garden to grow vegetables and a rockery/drought-resistant garden

Tony Leach, Gresham: visiting expert – hunting for and identifying different types of fungi in the school grounds, making and putting up bird-boxes

Blicking NT: group worked with Dave Brady, Chief Ranger and the gardening/estate team to remove invasive species eg. Rhododendron from the gardens. Used bowsaws, loppers and other hand-tools.

Redwings Horse Sanctuary: students learnt how to take care of the horses - included mucking-out, cleaning water troughs and discovering more about general animal welfare (don't think they ever actually handled the horses themselves)

Goldcrest Outdoor Education Ltd: Norwich private enterprise – teaches range of outdoor activities and sports in school grounds and supports staff in development of outdoor learning programmes

Vicky Eales, Archery: Wild4 – freelance archery instructor – visited school to introduce group to sport of archery

Police & Fire Brigade Aylsham: Students visited the local fire station and the fire-fighters demonstrated how to be safe around fires, large and small.

Sheringham Park NT :group worked with a National Trust Learning Officer - learnt how to tie basic knots, build shelters in the woods, light a Kelly-kettle and use maps and compasses to complete an orienteering challenge in pairs/ small groups around the grounds.

NCC Weavers Way: Geocaching. Team Trails. Weavers Way (just to north of Aylsham, runs through Drabblegate, Silvergate and then Blickling , Norfolk Coast Path?). Trails Officers introduced the group to map-reading, different OS Map symbols and sport of Geocaching, students located 5 geocaches positioned along the bridleway using apps on mobile devices / GPS.

Forest Schools: Southrepps. Led sessions in bush craft , shelter building and other team building activities

Aylsham High School

5 Mile Radius

10 Mile Radius

Bringing it all together

- Systems thinking
- Entrepreneurship Education
- Values Education

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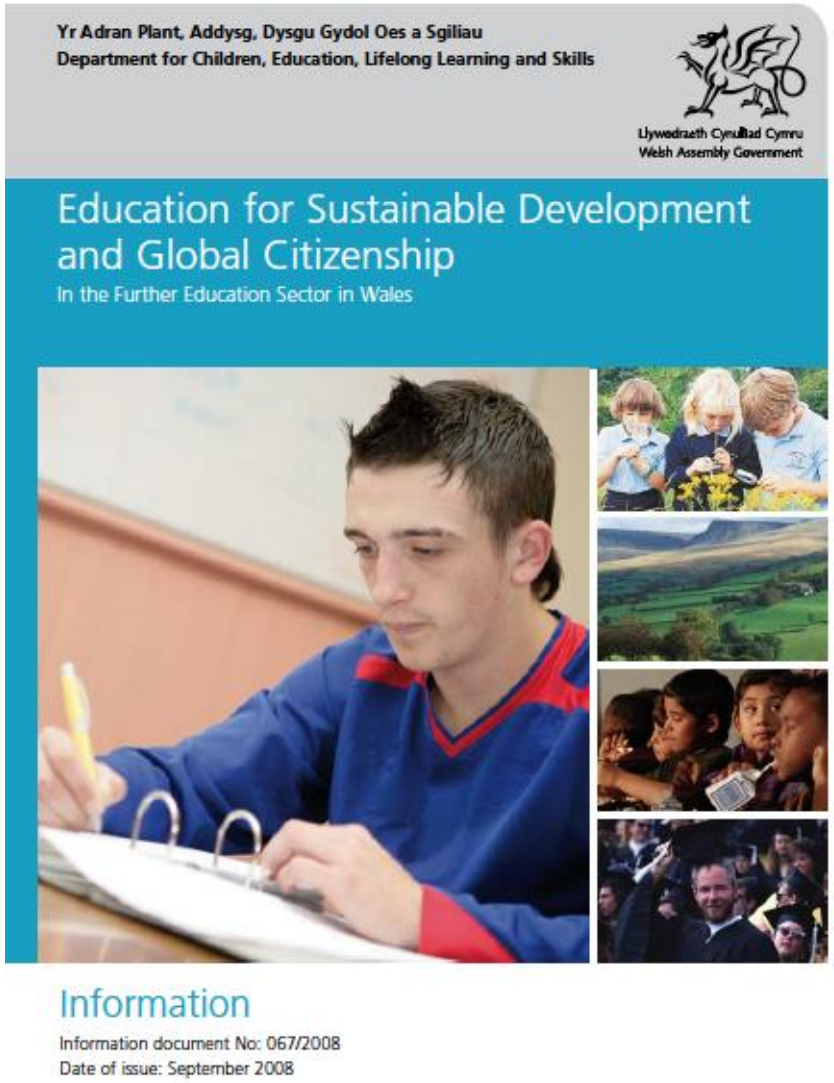
Module V

Evaluation of Teaching

ESD IN A TVE SCHOOL SETTING

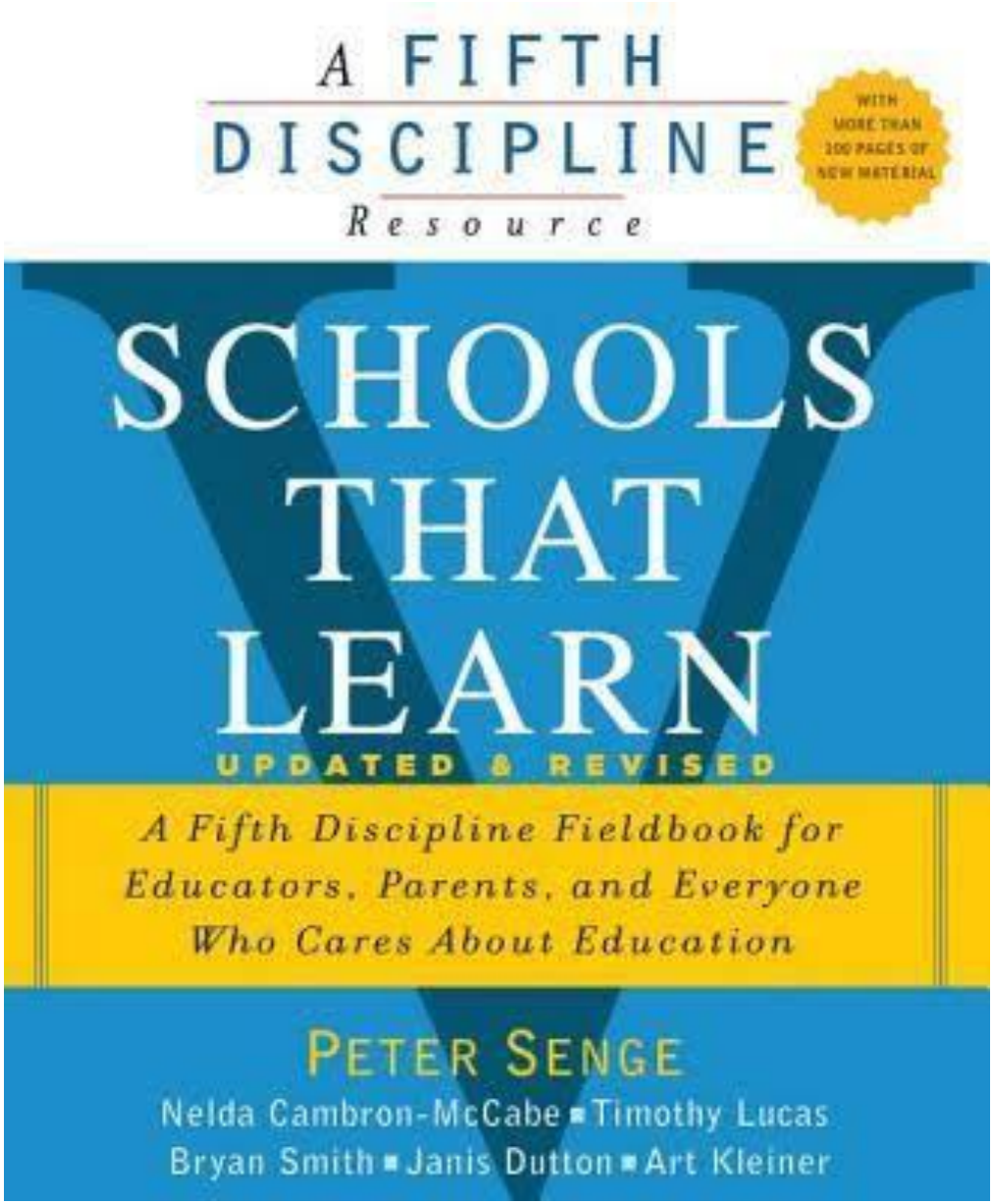
Curriculum Development	Teaching Methods and Approaches	Students' Awareness and Attitudes	Informal Learning (Ethos)	Leadership and Decision-Making	Research and Monitoring	Links and Partnerships
The curriculum has been audited for ESD	ESD is seen as additional content for a subject.	Students discuss controversial issues in an academic context.	The way in which resources, waste and people are managed in school is different from the messages taught in the curriculum.	Senior managers in the school recognise and support ESD.	Monitoring learning is limited to formal academic assessments.	Good links exist between the school and businesses and other organisations in the local community.
ESD is adopted by some subjects, but not by others	Teaching methods are designed to enable independent learning skills as well as delivering the curriculum.	Students can relate their learning to the world beyond the classroom.	Energy-saving, recycling and the procurement of resources at the school influence the behaviour of students and staff.	One teacher is responsible for ESD. All staff are consulted as part of the decision-making process on some ESD issues.	Teachers observe and work with each other in the classroom.	Out of classroom learning takes place in the local community and the local environment.
All staff are aware of ESD. ESD is considered by all subjects independently.	Teaching methods require students to be active participants in their own learning rather than be receivers of information.	Students are capable of understanding complex issues that do not have simple answers.	Teaching staff, non-teaching staff and students have a common attitude towards caring for each other and caring for the environment.	There are leaders for ESD at all levels among staff and students. Staff and students are regularly consulted on ESD issues.	Individual staff engage in research to test and improve teaching and learning.	Students are involved with international school links and recognise that issues can be local and global.
ESD is integrated in all curriculum development from planning to delivery. There is strong cooperation between subjects.	Research into the students' perceptions of learning is used for the planning and delivery of the curriculum.	Students are capable of critical thinking. They question information and ideas and change their attitudes and behaviour accordingly.	The school campus, the learning environment and the school management supports an ESD approach in the classroom.	Democratic and participatory decision-making involving the whole school is formalised as part of the management structure.	Staff collaborate in action research to improve the student experience across subjects.	Students actively contribute to projects in the local community and the wider community.

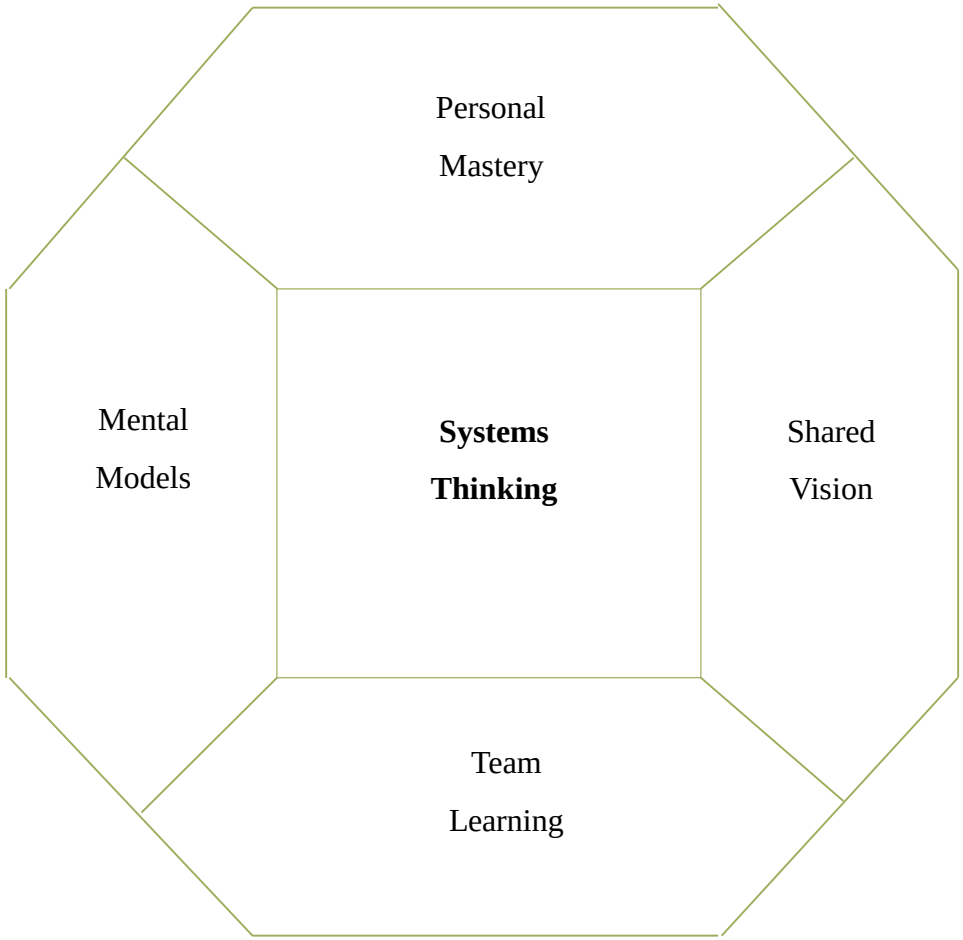
Whole School Approach



Common Areas:

- Institutional Management
- Commitment and Leadership
- Teaching and Learning
- Community and Partnership
- Research and Monitoring
- Joining-up practice


A FIFTH DISCIPLINE
Resource
WITH MORE THAN 100 PAGES OF NEW MATERIAL
SCHOOLS THAT LEARN
UPDATED & REVISED
A Fifth Discipline Fieldbook for Educators, Parents, and Everyone Who Cares About Education
PETER SENGE
Nelda Cambron-McCabe ■ Timothy Lucas
Bryan Smith ■ Janis Dutton ■ Art Kleiner



Senge's Five Disciplines

Interconnected Thinking/Systems Thinking

“Briefly, interconnected thinking needs to find an appropriate place in schools and further education as of today.”

Frederick Vester (2007)The Art of Interconnected Thinking

Whole School Approach

- **Teaching and Learning**
  - **Formal**
  - **Informal**
- Management of the School
  - Leadership and Governance
  - Buildings and Grounds
- Staff Development
- Partnerships and Community Links
- *Joining-up practice*

Teaching and Learning

- **Formal Curriculum**
  - **Review/Audit**
    - Links between subjects/courses
    - Sustainable development linked to vocational area
    - Sustainable Entrepreneurship
    - Competences
    - SDGs

Sustainable Entrepreneurship

Sustainability Meets Entrepreneurship

Manual and Handbook for the Met-ESD Project

Dimensions Competences	Knowledge	Skills	Attitude
Issue competence *(Caring for your vocational environment)*	About vocational fields related to ESD *Awareness of sustainable development issues relating to their vocational area*	Working with methods and instruments *Selecting and applying methods and knowledge in relation to sustainable development in the vocational context*	Global learning Green economy saving environment *Adopting the values for prioritising the sustainable option*
Social competence *(Caring for others)*	Communication, teamwork *Understanding the networks associated with the vocational area e.g. supply chains*	Solving conflicts Steering dialogues *Leadership skills and advocacy in regard to sustainable development options*	Open-mindedness Empathy Solidarity *Open to changing ideas, empathy with others in the networks*
Self competence *(Caring for yourself)*	Personality, emotion Behaviour *Understanding own abilities, ambitions and limitations*	Designing own life- and career curriculum *Future visioning and action-planning*	Courage and heart Authenticity *Re-assessing individual worldview*
Design competence *(Taking action on the above)*	About process designing structure building *Understanding the consequences of your actions*	Designing processes and products *Moving from planning to action and applying systems thinking*	Dealing with variety and difference *Adopting a systems perspective*

SDGs

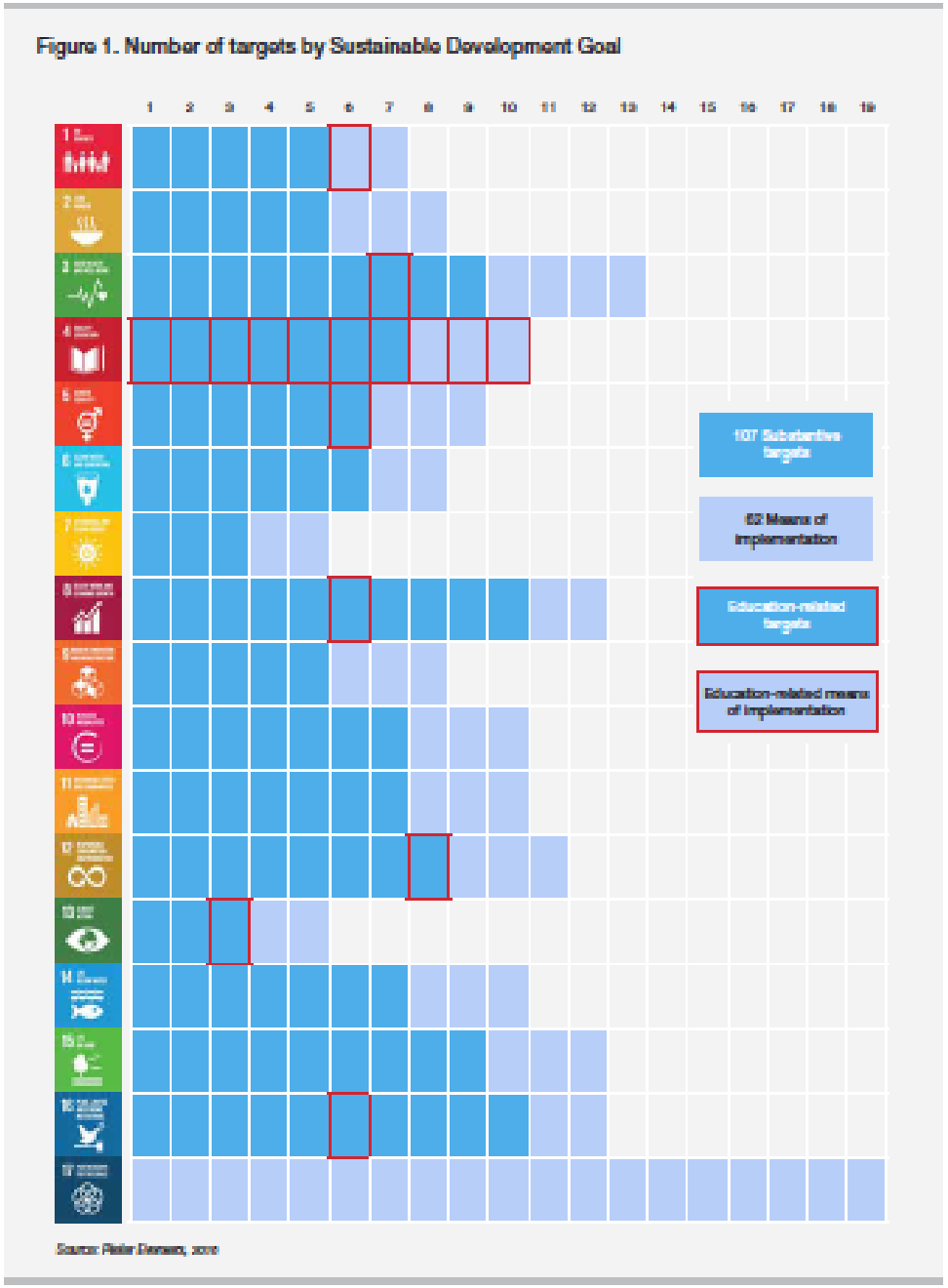
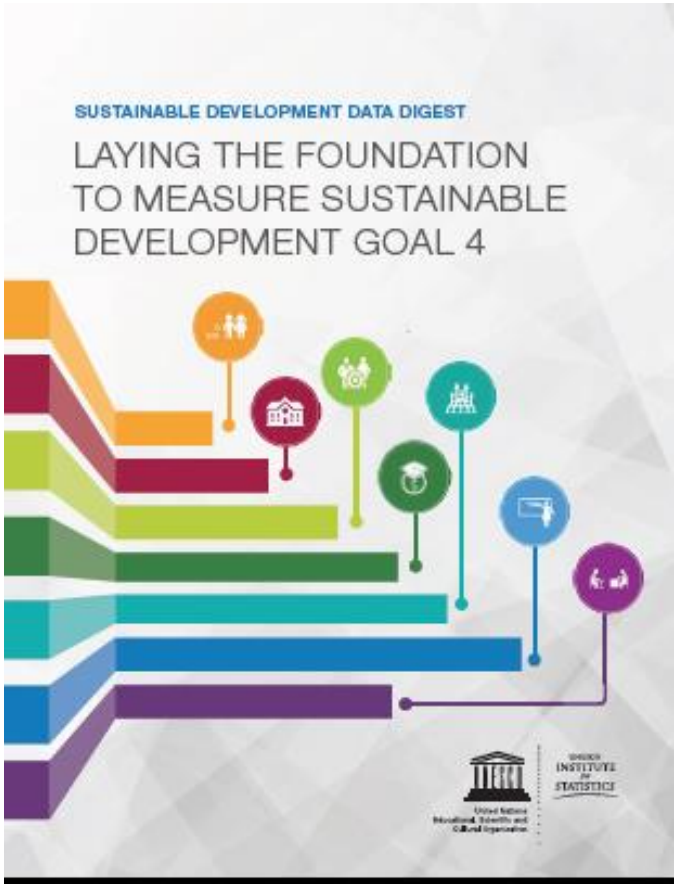


Figure 1. Number of targets by Sustainable Development Goal
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
107 Substantive targets
62 Means of implementation
Education-related targets
Education-related means of implementation


SUSTAINABLE DEVELOPMENT DATA DIGEST
LAYING THE FOUNDATION TO MEASURE SUSTAINABLE DEVELOPMENT GOAL 4
INSTITUTE FOR STATISTICS

SDGs

- Goal 1. End poverty in all its forms everywhere
- Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3. Ensure healthy lives and promote well-being for all at all ages
- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5. Achieve gender equality and empower all women and girls
- Goal 6. Ensure availability and sustainable management of water and sanitation for all
- Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 10. Reduce inequality within and among countries
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12. Ensure sustainable consumption and production patterns
- Goal 13. Take urgent action to combat climate change and its impacts*
- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Pedagogy

UNECE, 2011, Learning for the Future: *Competencies in Education for Sustainable Development.*

UNESCO, January 2007, *Good Practices in Teacher Education Institutions*, Education for Sustainable Development in Action.

WWF-UK, 2012, *WWF Professional Development framework of Teachers Competences for Learning for Sustainability*

ESD pedagogies stimulate students to ask questions, analyze, think critically and make good decisions. Such pedagogies move from teacher-centred to student-centred lessons and from rote memorization to participatory learning.

ESD Pedagogies are often place-based or issues-based.

(UNESCO, 2012. The education for sustainable development sourcebook. Education for Sustainable Development in Action, Learning and Training Tools No. 4. Paris: UNESCO.)

Informal Learning

- Student participation in school decision-making
- Student enterprise projects and competitions
- Student environmental groups
- Energy reduction and waste reduction schemes

Management of the School

- Management structure
- Grounds maintenance
- Waste management
- Procurement

Leadership at all levels

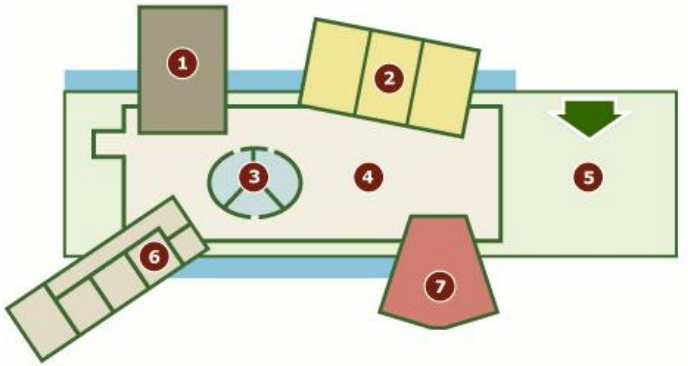
Institutional Management

The College Sustainability Committee is central to the whole college approach to ESDGC at Gorseinon. Student ideas and requests are fed into the management system through the College Environmental Group.

Gorseinon College Sustainability Committee structure

Virtual Tour

Welcome to the Genesis Virtual Tour.
Please select an areas to view its image gallery.



Sustainable urban drainage

Gallery

1. EARTH PAVILION
2. STRAW PAVILION
3. WATER PAVILION
4. GLASS PAVILION
5. GENESIS PAVILION
6. TIMBER PAVILION
7. CLAY PAVILION

Image Gallery / Showing 1 of 5


Stormsaver Rainwater Monitoring Unit
STORMSAVER
Hi, I'm Molly. This is how your rainwater recovery system works!!
Daily Reset
13845
Rainwater used today (Litres)
00028046
Rainwater used in total (Litres)
Filter Unit
00016715
Mains water used in total (Litres)


Our Building
Biomass boiler produces less carbon emissions
Photovoltaic cells make solar electricity
Solar hot water is heated on the roof
Rainwater harvesting uses rainwater to flush the toilets
Super insulation keeps us warm in winter, cool in summer
A wooden frame and cedar cladding uses less energy to build with
mead Primary School Eco Group -caring for ourselves, other people and our environment

HARTPURY
COLLEGE

SOLAR PV SYSTEM

CO2

7476 KG

Installed by GSM Ltd
HEATING > COOLING > RENEWABLE ENERGY

COLLEGE

SOLAR PV SYSTEM

F.I.T

39.81GBP

Installed by GSM Ltd
HEATING > COOLING > RENEWABLE ENERGY

SOLAR PV SYSTEM

POWER

23.28 KW

Installed by GSM Ltd
HEATING > COOLING > RENEWABLE ENERGY

HOME FARM EDUCATION FACILITY
Rainwater Harvesting System

Why use rainwater to flush toilets?

Water for drinking, taking a bath and preparing food has to be treated to make it safe to drink but for many purposes using water of this quality can be very wasteful.
For example, around half of the water we use in our homes is used only for flushing toilets, washing clothes, watering gardens and cleaning cars. For these uses, rainwater can be safely used.
By collecting and using rainwater, we can greatly reduce the need for supplies of drinking water. This means damage to the environment is reduced as less water is taken from rivers and from underground sources.

How the system works

Rainwater is collected from the roof drainage system and processed by the underground Wisy WFF vortex filters (1). About 90% of the rainwater is diverted into the storage tank. Debris and remaining water is taken away to drain in the normal manner.

A smoothing inlet (2) disperses the inlet flow into the tank preventing disturbance of the float switches and any sediments in the bottom.

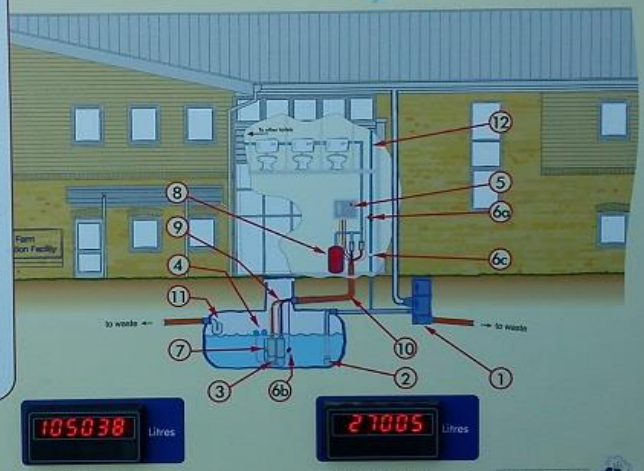
Water is supplied on demand by the twin submersible pumps (3) through floating suction filters (4) to the WCs. The pumps (3) are controlled by a control unit (5), which turns the pumps on and off when required.

During periods of low rainfall, a low-level of stored water is detected by float switch (6b) which opens the solenoid valve (6e).
Water from the mains supply (12) is discharged to the tank via a type AA air gap tundish (5c).

Float switch (7) provides dry-running protection for the pumps, and an expansion vessel (8) prevents pump "hunting".

Pressure hoses and cables (9) are ducted to the building through a 160mm drainage pipe (10).

Excess water is discharged from the tank via an overflow trap (11). This provides a water seal against any foul odours from drains.



105038 Litres
Volume of Rainwater Used

27005 Litres
Total Mains Water Used for Flushing

natural power


Wind Power
Power
Watt
0
Total Energy
kWh
10346
Daily Energy
kWh
7.4
Avoided CO_2 Emissions
kg
4448


The Sensory Garden
This Sensory Garden is designed with the five senses in mind, a place of beauty, which smells, sounds and feels wonderful.
It was inspired by the need to create a space that all our staff and students could access and enjoy, regardless of age, race, gender, religion or disability.
The design came from Paul Aston, a gardener who gave us the time and space to wander and explore the Cambridge University Botanical Gardens, and the advice and guidance to try and establish our own garden here at CRC.
This garden is dedicated to all our students with disability and sensory loss, who we hope can enjoy relaxing here as much as we enjoyed creating it.
"There is a garden in every childhood, an enchanted place where the colours are brighter, the air softer and the morning more fragrant than ever again"
Elizabeth Lawrence

PEMBROKESHIRE COLLEGE
NEW TECHNOLOGY AND CONSTRUCTION CENTRE

Site Location Plan

Aerial View of Pembrokeshire College

Pembrokeshire College Site Plan

College Entrance

College Main Building

View of Site from Stream

View of Technology Construction Centre Main Entrance

Austin-Smith:Lord

Coleg Sir Benfro Pembrokeshire College

Llywodraeth Cynulliad Cymru Welsh Assembly Government

PEMBROKESHIRE COLLEGE
NEW TECHNOLOGY AND CONSTRUCTION CENTRE

View of Entrance and West Facade

Perspective view of East Facade

View of Technology Construction Centre from Stream

Ground Floor Plan

First Floor Plan

Second Floor Plan

Third Floor Plan

Austin-Smith:Lord

Coleg Sir Benfro Pembrokeshire College

Llywodraeth Cynulliad Cymru Welsh Assembly Government

PEMBROKESHIRE COLLEGE
NEW TECHNOLOGY AND CONSTRUCTION CENTRE

Water Harvesting System

Bio Mass Sustainability Cycle

Ventilation strategy

Bio Mass Boiler

East Facade Shading Analysis

West Facade Shading Analysis

Solar Water Heating System

Ecotect Daylight Analysis

Ecotect Daylight Analysis

Sustainable building services strategies have been employed to maximise renewable energy use and energy efficiency throughout the building.

A combination of passive design and a biomass fired heating system; run on wood pellets from local sustainable sources provide adequate heating supplemented by a solar heating array located on the building facade. A water harvesting system is used to store grey water for non drinkable needs such as toilet flushing and gardening. Daylight factors have been carried out using Ecotect, an analysis model software package to analyse and provide solutions for daylighting needs.

All the above combined with WRAP, a concept that encourages the construction sector and clients to use resources more efficiently and helps reduce waste and cost during the whole life cycle of the building.

Ecotect Daylight Analysis

Ecotect Daylight Analysis

Austin-Smith:Lord

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Llywodraeth Cynulliad Cymru Welsh Assembly Government

Staff Development in Schools

- Self-reflection
- Opportunities to collaborate e.g. team teaching
- Critical friends

External Frameworks for Professional Development

UNECE, 2011, Learning for the Future: *Competencies in Education for Sustainable Development.*

UNESCO, January 2007, *Good Practices in Teacher Education Institutions*, Education for Sustainable Development in Action.

WWF-UK, 2012, *WWF Professional Development framework of Teachers Competences for Learning for Sustainability*

Partnerships and Community Links

- Work Experience placements
- Visiting speakers
- Community service/Volunteering
- Industry visits
- International exchanges
- Erasmus Projects

Design an ESD Vocational School

- Identify what you would expect to see in the school Your vision for the school
- Decide on the elements or categories that you are going to discuss. You can use these:
  - **Teaching and Learning**
  - Management of the School
  - Staff Development
  - Partnerships and Community Links
  - Joined-up practice

    OR
  - Adapt the headings to suit your own design
- Discuss what you would expect to see in each of the different areas and start to make notes.
- Decide how you are going to present your 'vision' of an ideal ESD TVE School on the flipchart paper

WHAT IS RESEARCH?


Purpose
Research Question
Data Collection
Analysis
Responses to the research questions
Further questions for research

If you were going to visit a Met-ESD school – what would you want to know?

If you were going to visit a Met-ESD school – what would you want to know?

- How has the Met-ESD Project contributed to changes in
  - The curriculum?
  - Teaching methods/Professional practice?
  - The school as a whole?

- What has been the impact on students?

How would you collect the data to answer these questions?

Data Collection:

- Observation
- Informal interview
- Photograph

What indicators will you be looking to observe and ask question on in order to gather the data to address the research questions?

(Think back to the outcomes of the previous session)

Whole School Approach 1

- Curriculum
  - Sustainability topics
  - Curriculum reviewed and changed
  - Cooperation across disciplines
- Approach to teaching
  - Participatory methods
  - Problem solving, scenario setting, independent learning
  - Non-conventional classroom spaces
- Management
  - Senior leaders demonstrate support
  - Communication
    - Staff and students have a voice
    - Staff and students aware of future vision
  - SD or environmental policy

Whole School Approach 2

- Buildings
  - Walls used to display teaching and learning
  - Energy saving and waste management clear to all users
- Relationships
  - Teaching/non-teaching
  - Staff/students
  - Student/student
- Partnerships and Community Links
  - Community organisation and companies present in school
  - Work placements
  - International links
- Ethos and culture
  - Messages on walls
  - Inclusive climate

Whole School Approach

- Curriculum
- Approach to teaching
- Management
- Buildings
- Relationships
- Partnerships and Community Links
- Ethos and culture

ANALYSIS

Any practitioner we would call ‘reflective’ would be able to:

- focus on some dimension of their pedagogy;
- see that dimension from a variety of perspectives using techniques of reframing and reflective listening;

And

- engage in dialogue with their peers in order to illuminate the boundaries and frames of thought which limited their current perspective, with the goal being to take action based on a thorough and reflective understanding of events, alternatives, and ethics.

McKenna, H. (1999). *Educating for social justice: Reflection and preservice teacher educators*

Reflective teachers *“can look back on events, make judgements about them, and alter their teaching behaviours in light of craft, research and ethical knowledge.”*

Valli, L. (1997). Listening to other voices: A description of teacher reflection in the United States. Peabody Journal of Education, 72(1), 67–88.

Table 1
Typology of reflection: dimensions and guiding questions

Dimension	Definition	Typical questions
Descriptive	Describe the matter for reflection	What is happening? Is this working, and for whom? For whom is it not working? How do I know? How am I feeling? What am I pleased and/or concerned about? What do I not understand? Does this relate to any of my stated goals, and to what extent are they being met?
Comparative	Reframe the matter for reflection in light of alternative views, others' perspectives, research, etc.	What are alternative views of what is happening? How do other people who are directly or indirectly involved describe and explain what's happening? What does the research contribute to an understanding of this matter? How can I improve what's not working? If there is a goal, what are some other ways of accomplishing it? How do other people accomplish this goal? For each perspective and alternative, who is served and who is not?
Critical	Having considered the implications of the matter, establish a renewed perspective	What are the implications of the matter when viewed from these alternative perspectives? Given these various alternatives, their implications, and my own morals and ethics, which is best for this particular matter? What is the deeper meaning of what is happening, in terms of public democratic purposes of schooling? What does this matter reveal about the moral and political dimension of schooling? How does this reflective process inform and renew my perspective?

J.K. Jay, K.L. Johnson, 2002. *Capturing complexity: a typology of reflective practice for teacher education* In Teaching and Teacher Education 18 (2002) 73–85

During the period of the Met-ESD Project keep a reflective journal and use it to write a final narrative report.

Make an entry at any time or at the following times:

When you notice a change in relation to ESD or entrepreneurship in your school. Why did it happen? What has changed as a result?

When you have introduced a new teaching method or activity. Why did you introduce the change? How did students react? What will you do next?

When you have made changes to the curriculum. Why make the change? How did the students react?


Purpose
Research Question
Data Collection
Analysis
Responses to the research questions
Further questions for research

Telling your story – A Report

Your Visits

What changes have your peers/critical friends in the schools that you visited experienced in relation to curriculum and pedagogy as a result of the Met-ESD Project?

What indicators of introducing an ESD approach did you detect in the schools that you visited? To what extent could these be attributed to the Met-ESD Project?

Your Practice

What has been the impact on your own professional practice? How has it changed as a result of the Met-ESD Project? What have you learnt from your critical friends?

What has been the impact on the curriculum/course that you teach? Has the content changed especially in relation to entrepreneurship?

What has been the impact on your pedagogical approach? Have you introduced new methods or activities to the classroom?

Your School

What developments have taken place in your school as a result of the Met-ESD Project in relation to:

Curriculum, pedagogy, school management, partnerships and community links?

Reflections on Met-ESD as a whole

MetESD

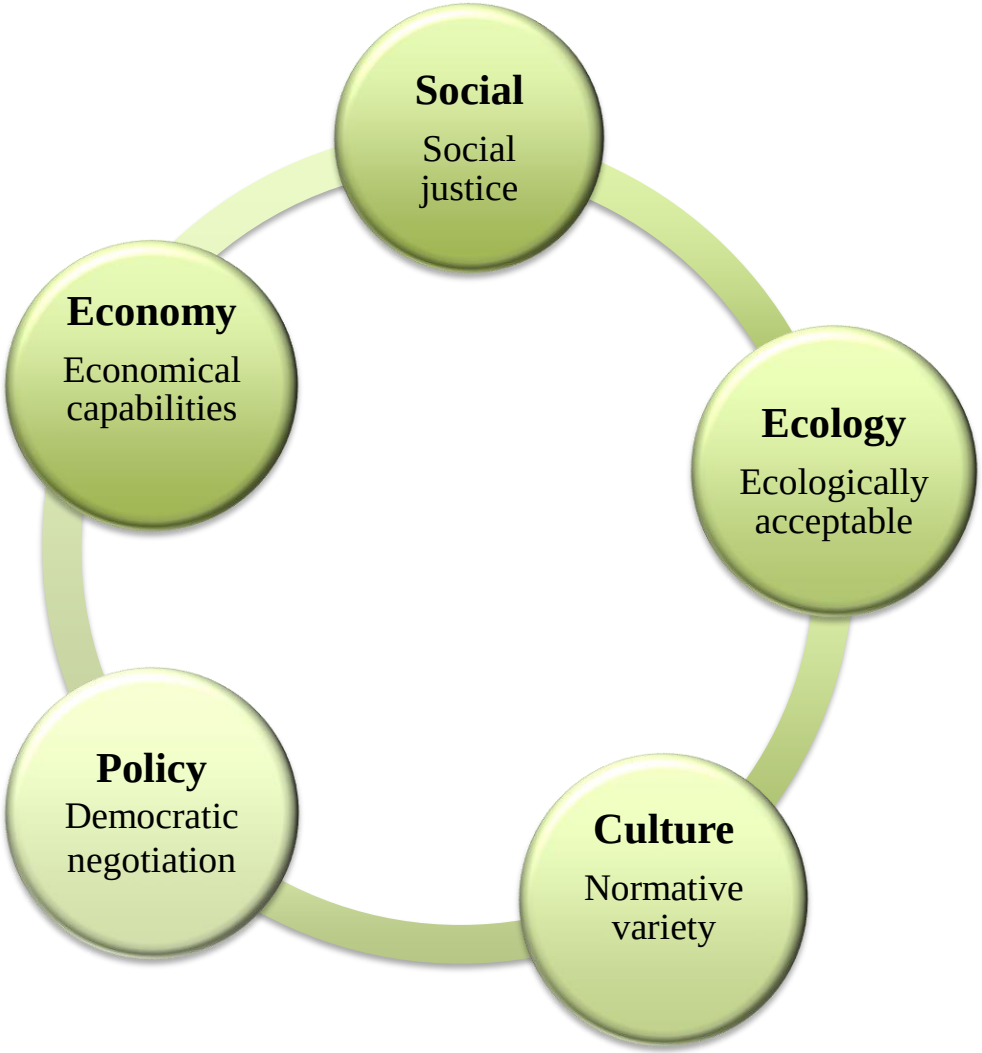
Methods for
Education for sustainable development (ESD)
competencies and curricula

Module VI

Curriculum Development Process

ESD framework

- guiding principles
- fields of action
- related topics



Framework of ESD competences

Dimensions Competence	Knowledge	skills	attitude
Issue competence	About vocational fields related to ESD	Working with methods and instruments	Global learning Green economy saving environment
Social competence	Communication, teamwork	Solving conflicts Steering dialogues	Open-mindness Empathy Solidarity
Self competence	Personality, emotion behavior	Designing own life- and carreer curriculum	Courage and heart authenticity
Design competence **Handlungskompetenz** **Competence to perform**	About process designing structure building	Designing processes and products	Dealing with variety and difference

Global goals as the pratice fields for MetESD

Background teaching ESD

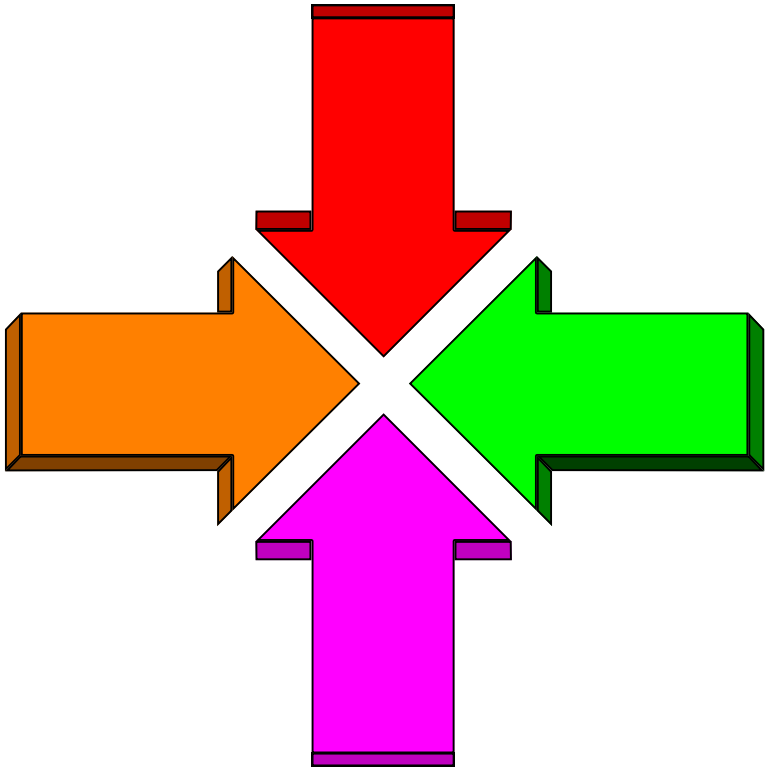
- Life experiences impact the way people learn
- As students are getting younger, schools are aging
- Challenge for schools to be effective in teaching and to make teaching and learning *relevant*

Background - Our Students

- Surfers and scanners – not readers and digesters
- Expect constant and immediate feedback
- Want directness over subtlety
- Technologically savvy but crave personal contact
- Always hurried – know what they want
- Want to learn

Fundamental Questions in Developing Curriculum

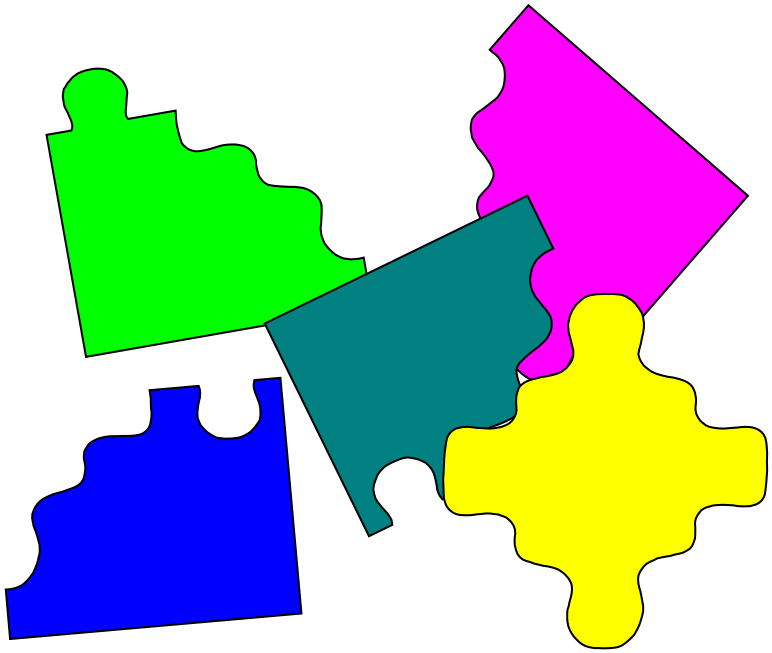
What educational purposes should the school seek to attain towards ESD?



Fundamental Questions in Developing Curriculum

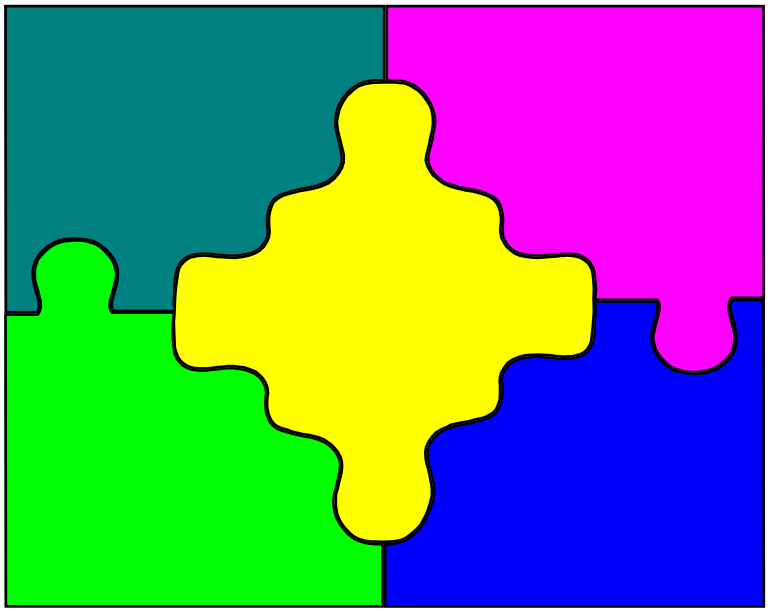
What educational experiences can be provided

that are likely to attain these purposes of ESD?



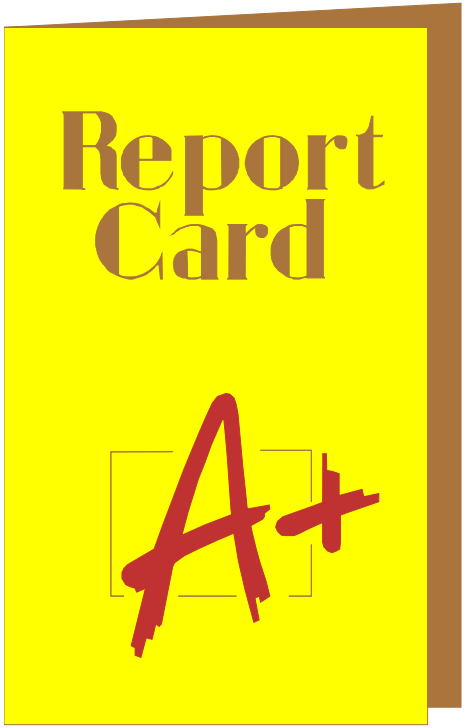
Fundamental Questions in Developing Curriculum

How can these educational experiences be effectively organized?



Fundamental Questions in Developing Curriculum

How can we determine whether and to what extent these purposes are being attained?

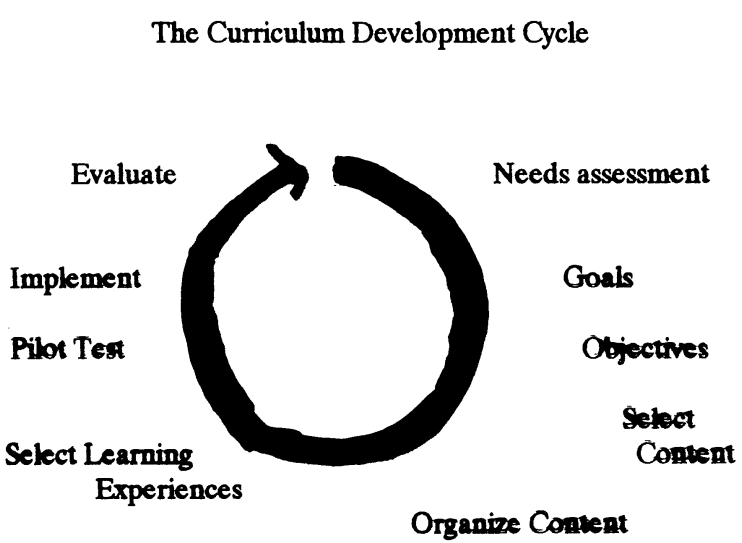


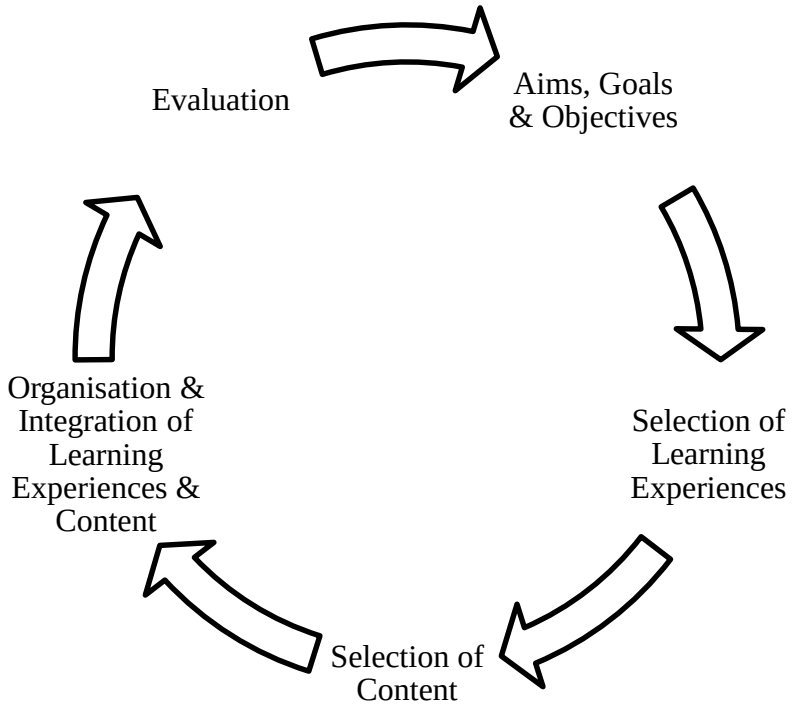
The curriculum development cycle

- Eight steps to better schools and better learning

Curriculum Development

- Wheeler (1978) who believes that curriculum decision making can start from any point and can come back to any of the points e.g. like a cycle



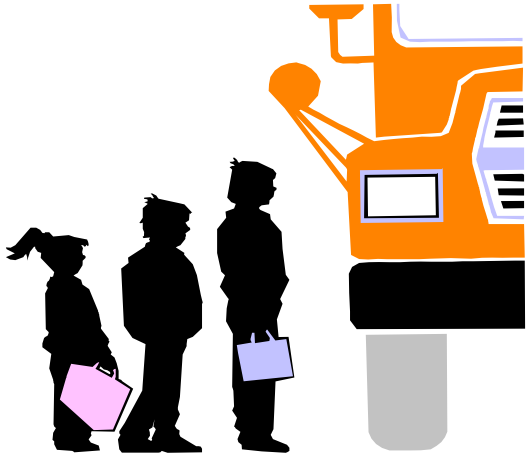


Let’s examine what happens in each step of the curriculum development/revision cycle. This cycle is a dynamic system that helps each school re-vitalize and replenish what is taught to its students.

- Needs assessment

Needs of the Learner

* **Cognitive development**
* **Linguistic development**
* **Psycho-social development**
* **Moral/affective development**
* **Vocational focus**



Don’t forget the qualitative information. For either one child or for a school, interest inventories can tell a lot, as can opinion polls.

- Goals / competencies

Writing Goals (second step)

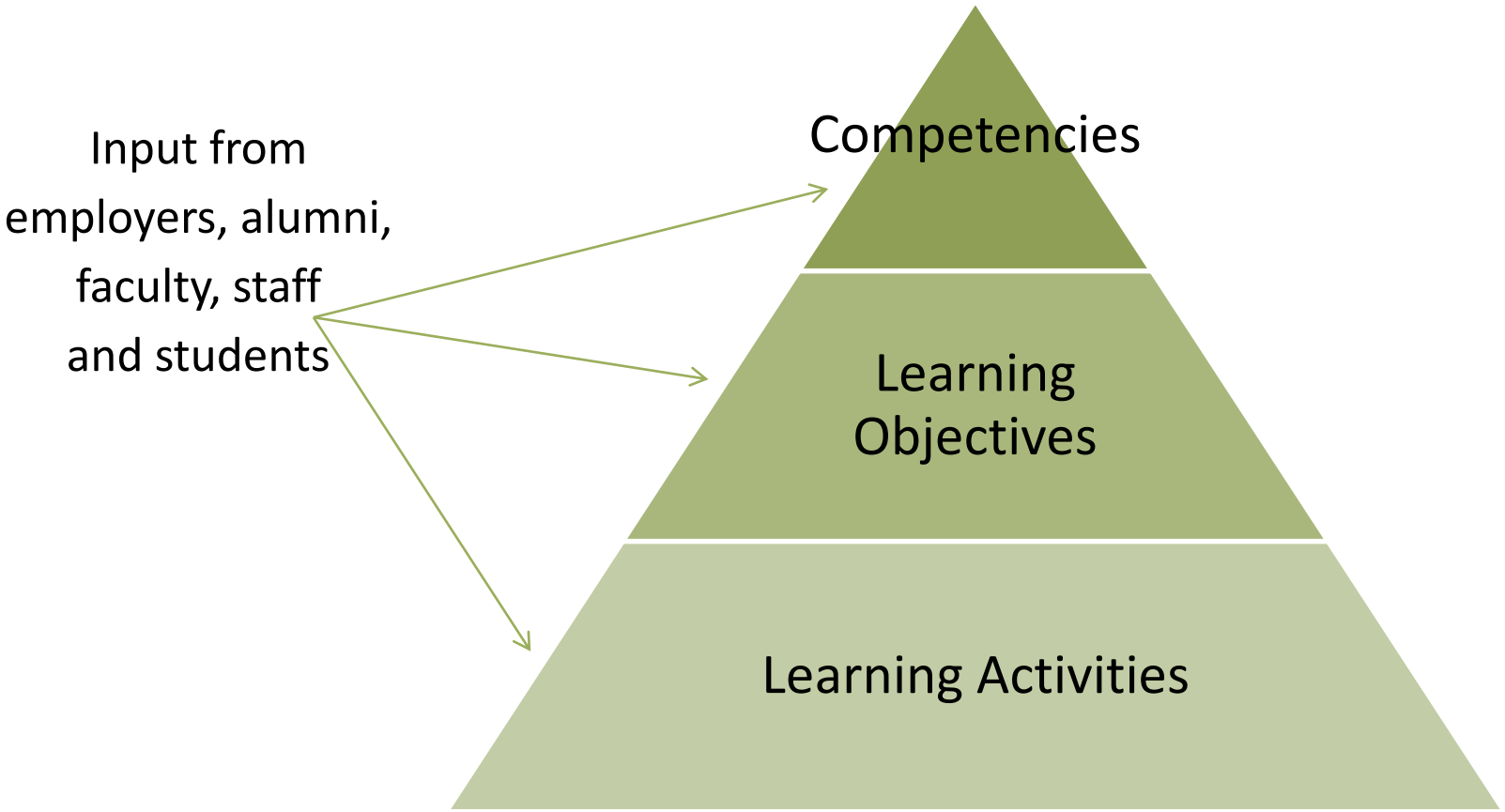
- Goals do not have to be behavioral, but should be translatable into behavioral language

- Need enough goals to point the way

Goal versus Objective comparison chart

	Goal	Objective
Meaning	The purpose toward which an endeavor is directed.	Something that one's efforts or actions are intended to attain or accomplish; purpose; target.
Example	I want to achieve success in the field of genetic research and do what no one has ever done.	I want to complete this thesis on genetic research by the end of this month.
Action	Generic action, or better still, an outcome towards which we strive.	Specific action - the objective supports attainment of the associated goal.
Measure	Goals may not be strictly measurable or tangible.	Must be measurable and tangible.
Time frame	Longer term	Mid to short term

Competencies



Competencies

- Defined by the needs of the workforce and are the essential knowledge, skills and attitudes (KSA's) required to achieve an acceptable level of performance
- Achieved through formal training in the classroom and through hands-on field work (e.g., capstone experience, practicum)

Competencies

- Each competency is supported by multiple learning objectives.
- Learning objectives for the core competencies generally fall in lower-middle cognitive domains of Bloom's Taxonomy (knowledge, comprehension, application, analysis)
- Concentration-specific and cross-cutting (or interdisciplinary) objectives are more complex and include synthesis and evaluation

- objectives

Writing objectives (3rd)

- Objectives are more detailed
- Audience, behavior, conditions, degree
- In cognitive, affective, and psychomotor domains
- Assessments should be written from objectives

- Selecting content

Selection of Content & Learning Experiences

- Content is what we teach; learning experience is an activity which the learner engages in which results in changes in his behaviour;
- We should select those contents and learning experiences that will in attaining the goals of the curriculum;
- There are some factors to consider in selecting both learning experiences and content.
- We shall first examine those criteria for selecting learning experiences

Factors in Selecting Learning Experiences

- Validity: this refers to the relevance of the stated learning experience to the stated goals of the curriculum;
- Relevance to life: learning experience must be related to the learner's real life situations in and out of school;
- Variety: learning experiences must cater to the needs of different types of learners by providing different types of experiences;
- Suitability: learning experiences must be suitable to the learners present state of learning and characteristics:

Selection of learning experiences...

- Cumulation: even though experiences provided may be different, they should all lead to the attainment of the same goal; subsequent experiences should build on earlier ones;
- Multiple Learning: a single learning experience may bring about multiple outcomes. Such learning experiences are important because of their multiple benefits.

Factors in Selecting Content

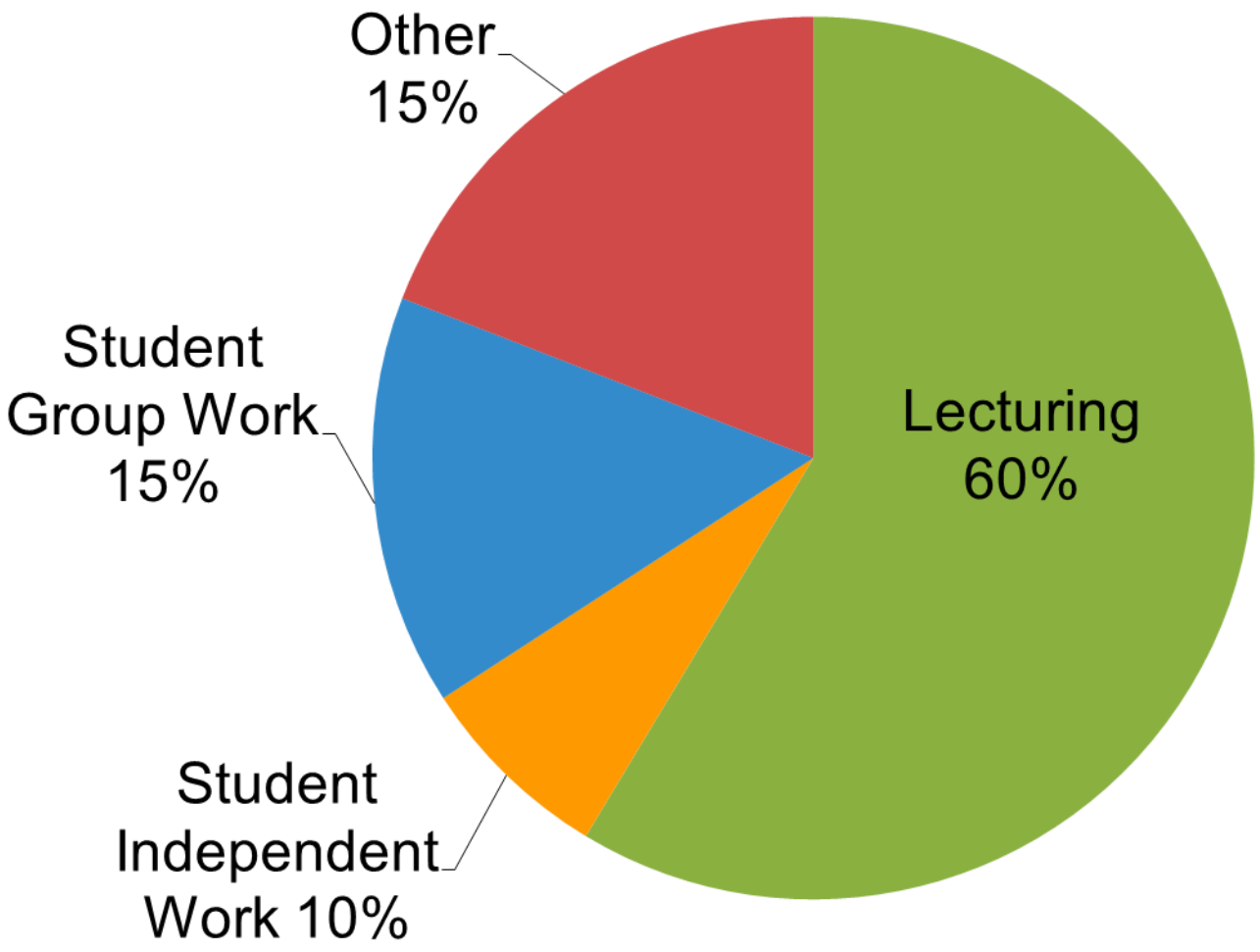
- Validity: means two things, is the content related to the objectives, and is the content true or authentic;
- Significance: is the content significant or will lead it to the more mastery or more understanding of the course or subject;
- Utility: here the question is whether the content selected is useful i.e. will lead to the acquisition of skills and knowledge that are considered useful by society?
- Interest: is the content interesting to the learner? Or can the content be made interesting to learners?
- Learnability: is the content selected such that learners can learn and understand given their present level/

Selecting content (4th)

- Keep in mind the mental age, the social and cultural circumstances of the persons the curriculum being written for.
- For special education, keep it very utilitarian. The content must be useful . . . These will remember, at the most, one-half of what normal persons would.
- Build on students' past experiences.

- Organizing content

How a school Spend In-Class Time



Lecturing

- Research has shown that it is impossible for students to absorb all of the information in a lecture (limited short term memory)
- We need every student to learn – not just a few
- More effective approach – get students thinking and learning

Student's Expectations

- Want solid knowledge base and real-world applications
- Want clear and organized presentation of material
- Want to be stimulated, active and participatory
- Want to know why (how does this activity, reading connect to my future career?)
- Want faculty to be enthusiastic, helpful and engaged
- Expect "customer service"
- Want face-to-face contact but OK to set boundaries

School's Challenges

- Time
  - Keeping up with their field
  - Dealing with students with varied backgrounds and skill levels

Strategies

- We must understand learners
- Accept differences among students and between students and school
- Engage students in setting goals and expectations
- Be flexible, creative and try not to be surprised by anything that happens in the classroom!

Strategies

- Problem-based learning
- Student-centered instruction

- Competency-based (outcomes-based) instruction

Student-Centered Learning

- Substitute active learning projects and experiences for lectures
- Hold students responsible for material not yet covered
- Assign open-ended questions and problems
- Use simulations, role-playing
- Use self-paced or cooperative (team) learning

Student Challenges

- Students feel that teachers have changed the rules
  - Teachers not teaching
  - Paying tuition for what?
- Team based learning - some do not want to work in groups
  - Do all members contribute equally?
  - Too difficult to schedule, coordinate
  - Some dominate, others hide

Faculty Challenges

- Fear – stop lecturing & lose control
- Won’t cover all of the material
- Will students do the work?
- Fair assessment of group and team work
- Repercussions of student dissatisfaction (lower ratings, etc)

Organization of content (5)

- Logical sequencing of content always helps.
- Build in some repetition
- Provide for loop-backs for students to re-visit things that they may have forgotten
- Spiral curriculum is one very effective plan

- Selection of learning experiences

Selection of learning experiences

- Learning experiences do not stand alone--they must relate to objectives of ESD
- Fun!
- Interesting!
- Multi-sensory
- Use technology and first-hand-experiences as often as possible

EVALUATION

DEFINITION OF EVALUATION

Curriculum evaluation is a systematic process of determining whether the curriculum as designed and implemented has produced or is producing the intended and desired results.

It is the means of determining whether the program is meeting its goals, that is whether the measures / outcomes for a given set of instructional inputs match the intended or pre-specified outcomes. (Tuckman, 1979)

Types of Evaluation

1. Humanistic approach – goal free
2. Scientific approach – purpose driven

Objectives of Evaluation

1. Scope – (teaching – program-cost effectiveness)
2. Timing – (formative, summative, impact)
3. Method – (quantitative, qualitative)
4. Level – (classroom, school, national)
5. Personnel involved – (individual teachers, committees, consultants)

The evaluation at the end of one curriculum cycle feeds right into the needs assessment of the next. In this way, the curriculum of the school--or for one child--is perpetually replenished and revitalized.

IMPLEMENTATION

IMPLEMENTATION MODELS

1. Overcoming Resistance to Change (ORC)
2. Leadership Obstacle Course (LOC)
3. Linkage Model
4. Organizational Development (OD)
5. Rand Change Agent Model

ORC Overcoming Resistance to Change

Focuses on overcoming staff resistance to change that is present immediately before, or at the time of the introduction of the innovation.

LOC Leadership Obstacle Course

- Extends the ORC model and puts emphasis on the gathering of data to determine the extent and nature of the resistance in order to deal with it appropriately.

The Linkage Model

- The linkage process involves a cycle of diagnosis, search, retrieval, formulation of solution, dissemination and evaluation.

OD Organizational Development

- This model is an information-processing change strategy that enables the system to improve its operations and the quality of interactions among its members to facilitate the introduction of change.

Rand Model

The Rand Model is based on the assumption that the success of the implementation of new program depends on:

A. The characteristics of the proposed change

B. Competencies of the teaching and administrative staff

C. The support of the local community

D. The School organizational structure

Factors Affecting the Choice of Implementation Model

1. Level of Resistance
2. Type of desired change
3. Available expertise
4. Available resources
5. Urgency of the situation

Getting from Here to There….

Students

Learn best when outcomes are clear and integrated into relevant context

Need practical - not hypothetical - experiences

Competencies

Increasing relevance and accountability in curricula

Challenges

Too many competencies

Levels vary

Assessment

Course Design

- Define competencies
- Map the learning objectives that support each competency
- Determine activities and assessments that promote student learning that are **authentic** (i.e., scenarios reflecting what students would actually do in practice) and that are feasible to administer

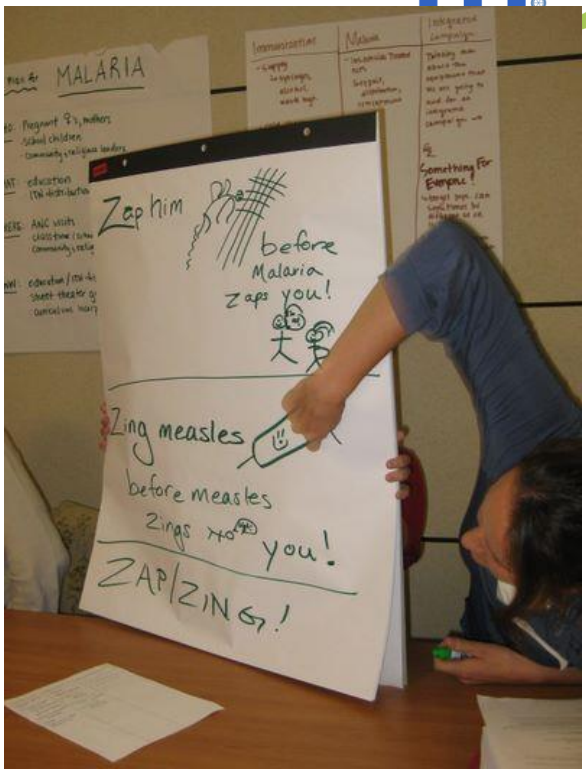
Teaching Strategies

- Set context
- Tie topics together continually
- Pre-assignments
- In class lectures and activities
  - Opportunity to practice – with feedback
  - Audience response system “clickers”
  - Short but realistic examples
- Assessments

Summary

- Can’t satisfy everyone so mix it up!
- Teach to the top
- Use student-centered approaches
- Use effective technology (audience response, real examples)
- Consider team work, peer-to-peer exchange
- Stay connected

Strategies



- Use different methods
  - In-class
  - Outside of class (must link to course objectives)
- Encourage critical thinking and synthesis
- Create opportunities for reflection
- Pre-class “assignments”

- Appendix

Background

- Life experiences impact the way people learn
- As students are getting younger, schools are aging
- Challenge for schools to be effective in teaching and to make teaching and learning *relevant*

Our Students

- Surfers and scanners – not readers and digesters
- Expect constant and immediate feedback
- Want directness over subtlety
- Technologically savvy but crave personal contact
- Always hurried – know what they want
- Want to learn

Generation X

- “Latchkey” kids – both parents working
- Many from single parent homes
- Technologically savvy
- Grew up with corporate downsizing and layoffs, fewer career opportunities

Generation X

- Independent, problem solvers
- Ambitious, self-starters
- Want support but do not want to be told what to do or how to do it
- Expect instant gratification, immediate feedback
- Know they must keep learning to be marketable

Generation Y

- Largest generation since baby boomers
- Many from divorced, single parent homes but parents are extremely hands-on (“decade of the child”)
- Overindulged, overprotected, self-absorbed
- Technologically savvy

Generation Y

- Self-confident, entitled
- Ambitious with high expectations
- Want to know process, rules, how to get ahead
- Expect to start at the top
- Want constant and immediate feedback
- Move quickly from one thing to another
- Not as independent as Gen X (parental back-up)

CURRICULUM APPROACHES

Curriculum Approaches

- 1. Technical – Scientific Approaches
- 2. Behavioral-rational Approach
- 3. System-managerial Approach
- 4. Intellectual –Academic Approach
- 5. Non-Technician / Non-Scientific Approach
- 6. Humanistic – aesthetic Approach
- 7. Re-conceptualist Approach
- 8. Reconstructionism
- 9. Eclectic Models

Technical – Scientific Approach

- The curriculum developers which may include specialists, superintendents, principals and coordinators are likened to engineers and architects who use instruments and empirical methods in preparing a blueprint with well defined elements orderly-sequenced procedures, and quality control measures to increase the probability of success in its implementation

Bases of Technical Scientific Approach

- 1. The curriculum will improve as the professional competence of teachers improves.
- 2. The competence of teachers will improve when they participate in curriculum development
- 3. When teachers share in shaping the goals and selecting the content and method of instruction as well as evaluating results, their involvement is assured.
- 4. When people interact during face-to-face sessions, they will better understand one another.

Behavioral-Rational Approach

- It is a means-end approach. Curricula developed through this approach become the actual blueprints which prescribe the roles of key figures in the educative process.
- Viewing the curriculum as the means and instruction as the end is a behavioral orientation.

Systems-Managerial Approach

- 1. Motivate interest of all stakeholders
- 2. Encourage participation and involvement of all stakeholders
- 3. Synthesize divergent viewpoints
- 4. Monitor curriculum implementation
- 5. Create a climate of innovation and change

Intellectual- Academic Approach

- Emphasizes the importance of theories and principles in curriculum planning.
- This model is influenced by the philosophy of John Dewey

Non-Technical / Non-Scientific Approaches

- Flexible and less structured without predetermined objectives to guide the learning-teaching process
- Contends that not all ends of education can be known nor indeed to be known in all cases.

Humanistic-Aesthetic Approach

- Argues that those who favor the rational approach miss the artistic and personal aspects of curriculum and instruction.
- It is rooted in progressive philosophy which promotes the liberation of learners from authoritarian teachers.

Reconceptualist Approach

- Criticizes the technocratic – scientific models as not sensitive to the inner feelings and experience of individuals.
- Reflects on existentialist orientation.
- The aim of education is not to control instruction in order to preserve existing order.

Reconstructionism

- The school is an institution of social reform.
- Criticizes the progressivists for putting too much emphasis on the individual learner to the neglect of the needs of society.

Eclectic Models

- Oftentimes, Filipino educators, in particular, prefer eclectic models (halo-halo) which are a combination of several approaches, rather than commit themselves to one particular approach only.
- Eclectic models are not mere patchwork (pagtagpi-tagpi) but a synthesis. (pagbuo o paghahabi) where desired features from several models are selected and integrated into a new whole.

Curriculum Design

- The Subject-Area Design
- The Integrated Design
- The Core-Curriculum Design
- The Child-Centered Design
- The Social Reconstruction Design
- The De-schooling Design

Subject – Centered Design

- FOCUS - A group of subjects or subject matter that represent the essential knowledge and values of society that have survived the test of time.
- PHILOSOPHICAL ORIENTATION – Essentialism
- PROPOENT / S – Adler, Hutchins

Integrated Design

- FOCUS - the integration of two or more subjects, both within and across disciplines, into an integrated course.
- PHILOSOPHICAL ORIENTATION – Experimentalism
- PROPONENT / S – Broudy, Silberman

Core Curriculum Design

- FOCUS – a common body of curriculum content and learning experience that should be encountered by all students – The great books
- PHILOSOPHICAL ORIENTATION – Perennialism
- PROPONENT /S – Goodlad / Boyer

Child-Centered Design

- FOCUS – Learning activities centered around the interests and needs of the child, designed to motivate and interest the child in the learning process.
- PHILOSOPHICAL ORIENTATION – Progressivism
- PROPONENT / S – Dewey , Eisner

Social Reconstructionist

- FOCUS – critical analysis of the political, social, and economic problems facing society; future trends; social action projects designed to bring about social change.
- PHILOSOPHICAL ORIENTATION – Social Reconstruction
- PROPONENT / S – Shane , Bramald

Deschooling

- FOCUS – in-school experiences, primarily in the social sciences, designed to develop the child's sense of freedom from the domination of the political, social, and economic systems; out of school experiences of equal value.
- PHILOSOPHICAL ORIENTATION – Social Reconstructionism
- PROPONENT /S - Freire , Goodman

MetESD

Methods for
Education for sustainable development (ESD)
competencies and curricula

Module X

In which world would you like to live in?

Workshop Content

Briefing

- In which World?
- Evolution of Worldviews
- Where are we today?

Ecosystems Game

Debrief

- Hexagon Method &others
- Ecosystems of Entrepreneurship
  - Gründerzentren
    Ecos4Entreps
  - Alternatives?
    Examples & Principles
- @ School ?

In which World?

… do we want to live in

- Utopia
- Dystopia

Entrepreneurs want to change sth, make the world a better place, want to make a living

- Patterns?

Evolution of Worldviews

- My World
    - is it

Evolution of Worldviews

- My World
  - is it a
    - bad one

Evolution of Worldviews

- My World
  - is it a
    - bad one → Dystopia

Evolution of Worldviews

- My World
  - is it a
    - bad one → Dystopia
    - good one

Evolution of Worldviews

- My World
  - is it a
    - bad one → Dystopia
    - good one → Utopia

Evolution of Worldviews

- My World
  - is it a
    - bad one → Dystopia
    - good one → Utopia
    - else?

Evolution of Worldviews

- My World
  - is it a
    - bad one → Dystopia
    - good one → Utopia
    - else? not determined

Evolution of Worldviews

- My World
  - is it a
    - bad one → Dystopia
    - good one → Utopia
    - else? not determined

Evolution of Worldviews

- My World
    - is it all about

Evolution of Worldviews

- My World
  - is it all about
    - ME

Evolution of Worldviews

- My World
  - is it all about
    - ME egocentric

Evolution of Worldviews

- My World
  - is it all about
    - ME ego-centric
    - US

Evolution of Worldviews

- My World
  - is it all about
    - ME — ego-centric
    - US — group/ethno-centric

Evolution of Worldviews

- My World
  - is it all about
    - ME ego-centric
    - US group/ethno-centric
    - US all

Evolution of Worldviews

- My World
  - is it all about
    - ME — ego-centric
    - US — group/ethno-centric
    - US all — world-centric

Evolution of Worldviews

- My World
  - is it all about
    - ME — ego-centric
    - US — group/ethno-centric
    - US all — world-centric

Where are we today?

- Teachers prepare pupils & students for unknown future, working for & against
  - Utopias
  - Dystopias

  On which level do we **activate** future Entrepreneurs?

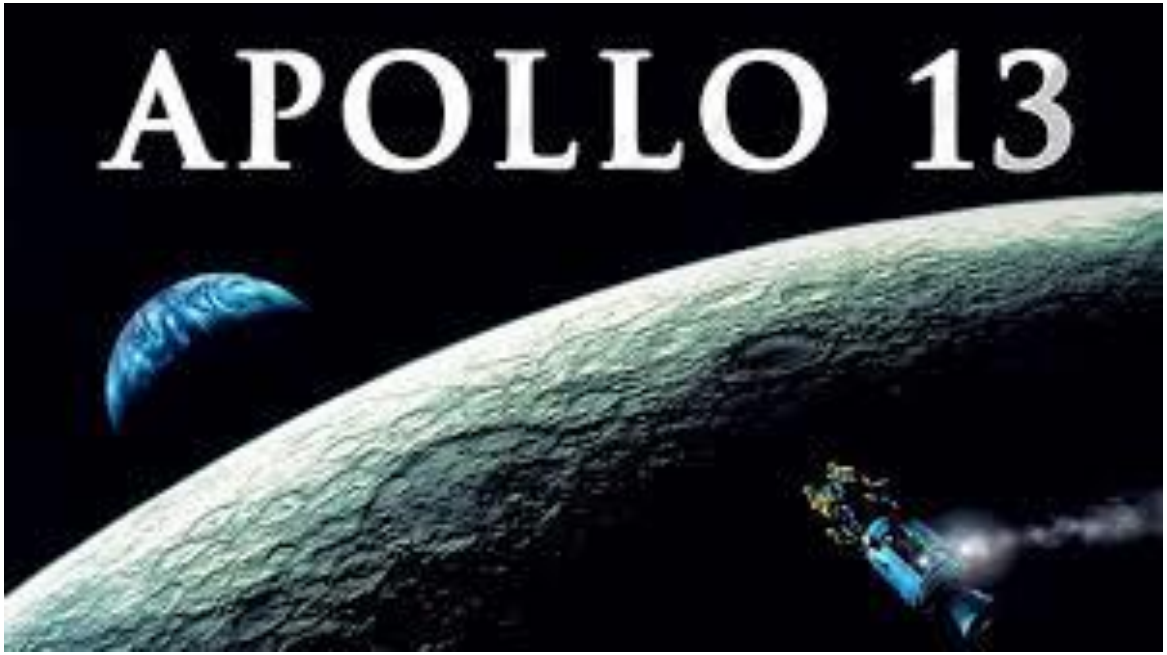
  Ego-centric | Group-centric | World-centric

  Which Areas and Methods of Change could be helpful?

Unknown Future

- Houston, we've got a
-

Unknown Future

- Houston, we've got a
- 

Unknown Future

- Houston, we've got a

- … but they returned safely

Unknown Future

- Houston, we've got a bunch of problems

Unknown Future

- Houston, we've got a bunch of problems
    - Ecological

Unknown Future

- Houston, we've got a bunch of problems
  - Ecological
  - Societal

Unknown Future

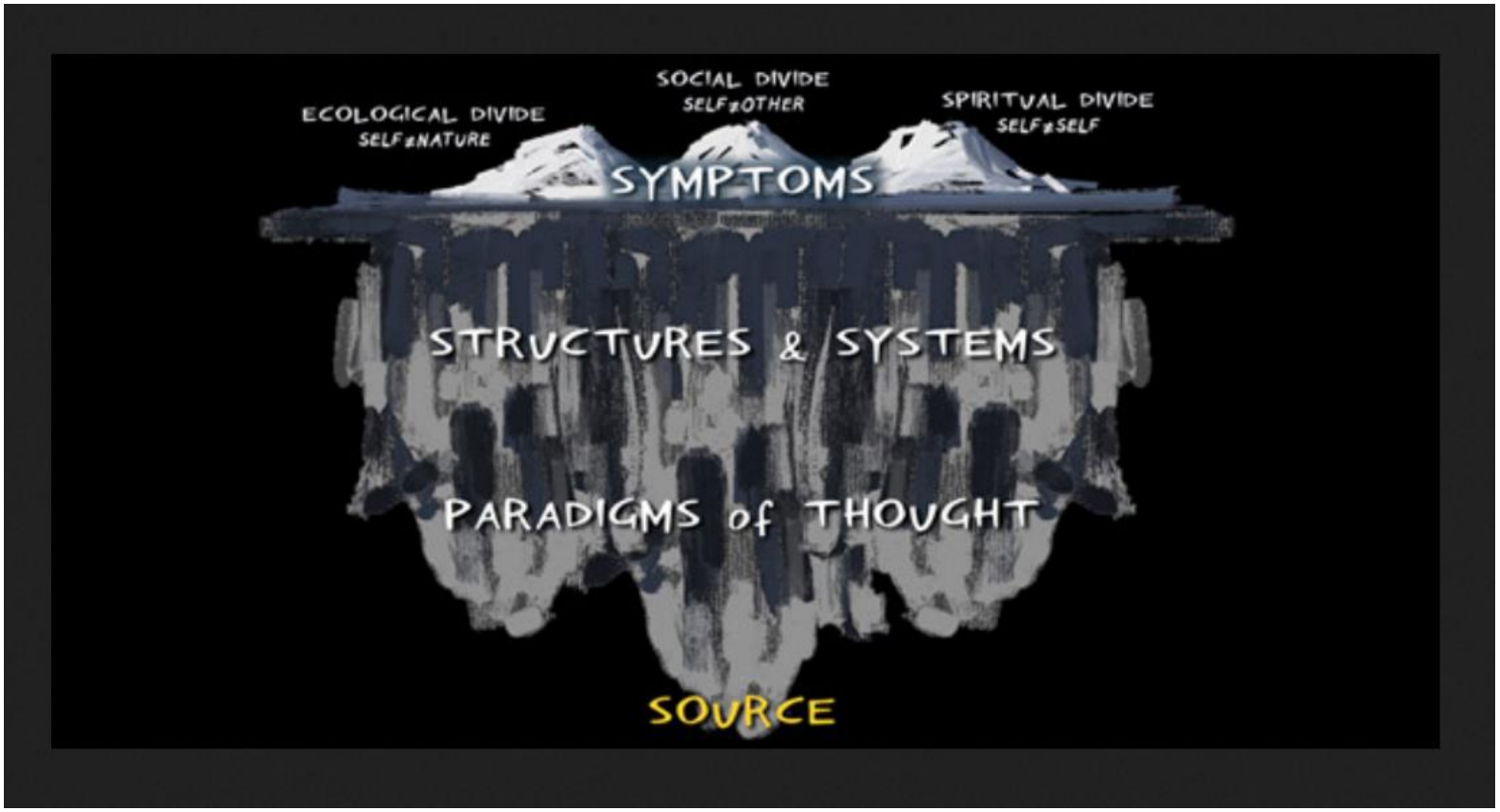
- Houston, we've got a bunch of problems
  - Ecological
  - Societal
  - Individual

Unknown Future

- Houston, we've got a bunch of problems
  - Ecological
  - Societal
  - Individual

… but we can handle them if

Unknown Future



Desireable Future

- Save and just Space for Humanity
- Ecological Ceiling
- Social Basement
  - Doughnut Economics by **Kate Raworth**

Ecological Footprint

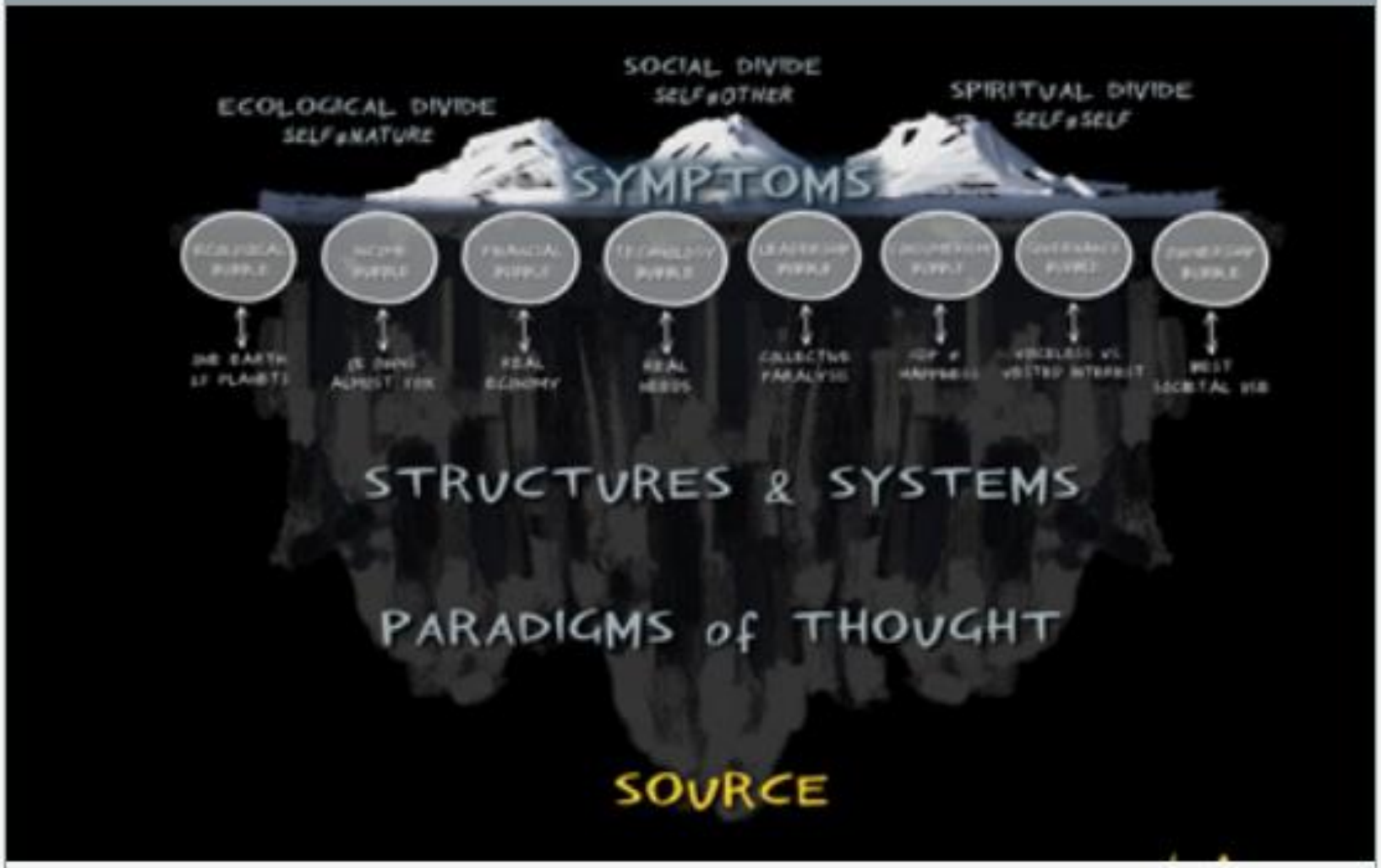
Wir hinterlassen einen gewaltigen Eindruck.

5 Areas:

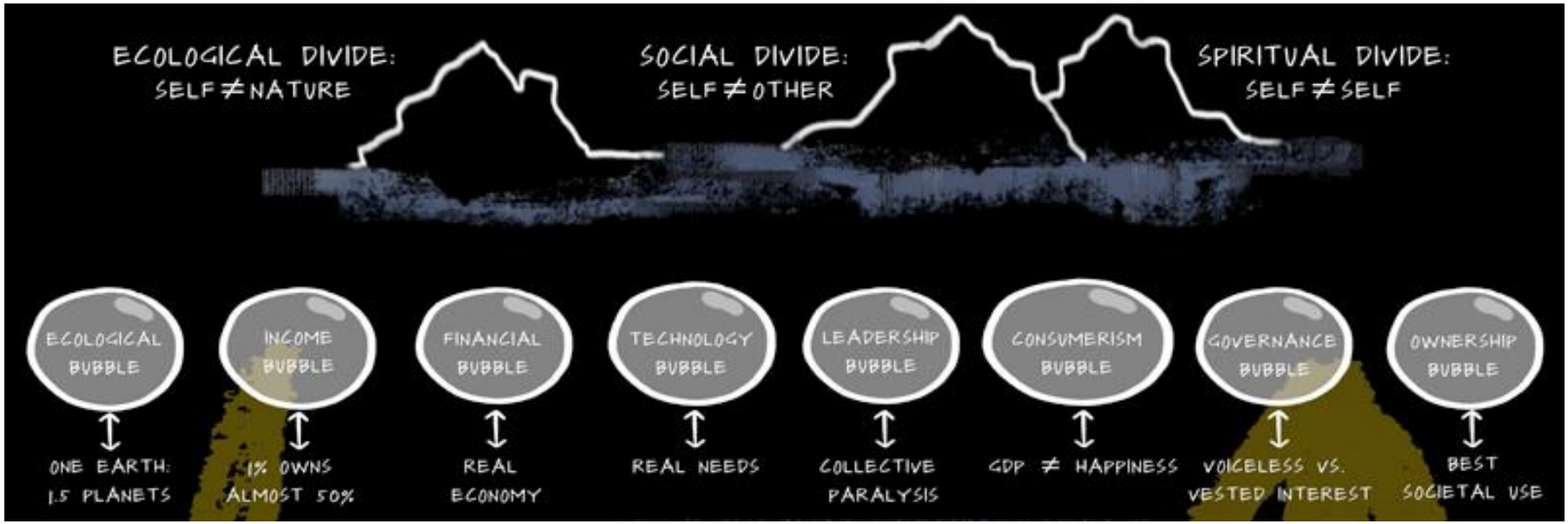
1) Energy
2) Settlement
3) Timber & Paper
4) Food & Fibre
5) Seafood

http://www.footprintnetwork.org/en/index.php/GFN/page/calculators/

Acupuncture points



Desireable Future



Living Systems: Ecogon

Living Systems: Ecogon

- Build resilient networks – **EcoSystems**
- by assembling **Organisms** around **Habitats**

- What do they need?

Living Systems: Ecogon

- Build resilient networks – **EcoSystems**
- by assembling **Organisms** around **Habitats**

  - What do they need?
  - How do they interplay?

Living Systems: Ecogon

- Build resilient networks – **EcoSystems**
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  - Can they resist to shocks from outside?

Living Systems: Ecogon

- Build resilient networks – **EcoSystems**
- by assembling **Organisms** around **Habitats**

  - What do they need?
  - How do they interplay?
  - Can they resist to shocks from outside?

Living Systems: Ecogon

Play

Have fun !

Living Systems: Ecogon

- What happened?
- Now remember the Iceberg
  What lies below the Waterline
  - Structures
  - Rhythms
- What Mindset / Paradigm is driving force?

Living Systems: Entrepreneurs

- **Hexagon Thinking**

Living Systems: Method

- **Hexagon Thinking**

1) Question to trigger thinking

Living Systems: Method

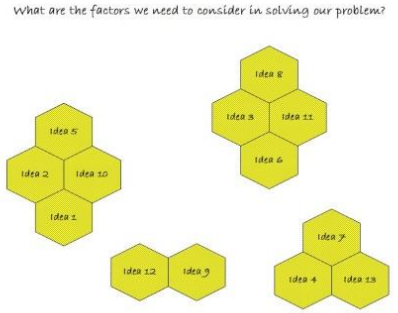
- **Hexagon Thinking**

1) Question to trigger thinking
2) Reflection and Gathering

Living Systems: Method

- **Hexagon Thinking**

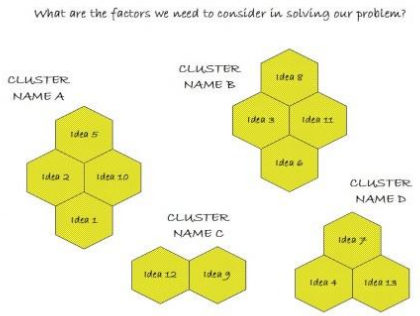
1) Question to trigger thinking
2) Reflection and Gathering
3) Clustering Ideas



Living Systems: Method

- **Hexagon Thinking**

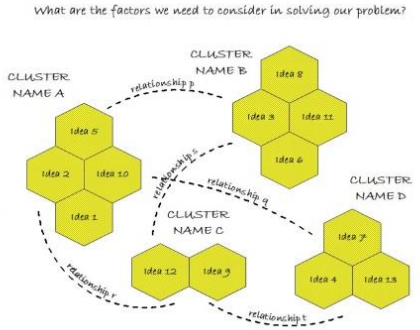
1) Question to trigger thinking
2) Reflection and Gathering
3) Clustering Ideas
4) Naming the Clusters



Living Systems: Method

- **Hexagon Thinking**

1) Question to trigger thinking
2) Reflection and Gathering
3) Clustering Ideas
4) Naming the Clusters
5) Crucial Relationships



Living Systems: Method

- **Hexagon Thinking**

1) Question to trigger thinking
2) Reflection and Gathering
3) Clustering Ideas
4) Naming the Clusters
5) Crucial Relationships
6) Answering the Question

Living Systems: Method

- **Hexagon Thinking**

1) Question to trigger thinking
2) Reflection and Gathering
3) Clustering Ideas
4) Naming the Clusters
5) Crucial Relationships
6) Answering the Question

Source: http://www.h3uni.org

Living Systems: Entrepreneurs

- **Hexagon Thinking**

Question to trigger thinking:

A) What elements are needed to constitute a entrepreneurial ecosystem?

B) What makes young people with crazy ideas successful?

Just take one to work

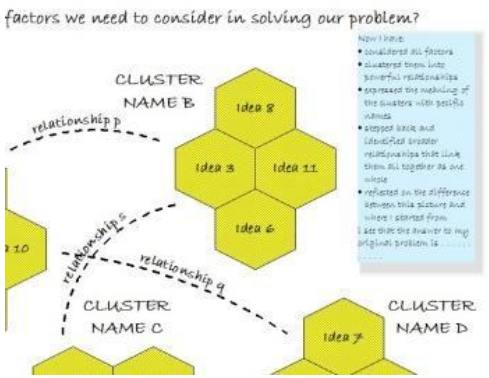
Living Systems: Method

- **Hexagon Thinking**

Living Systems: Methods

- Hexagon Thinking

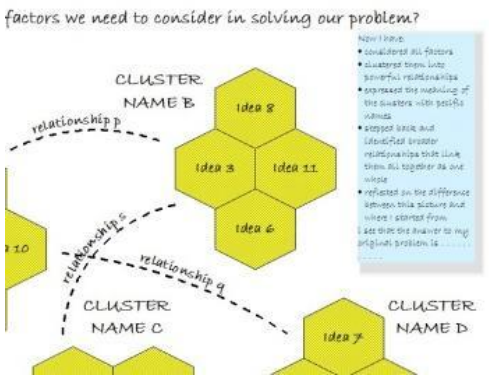
Concept Maps

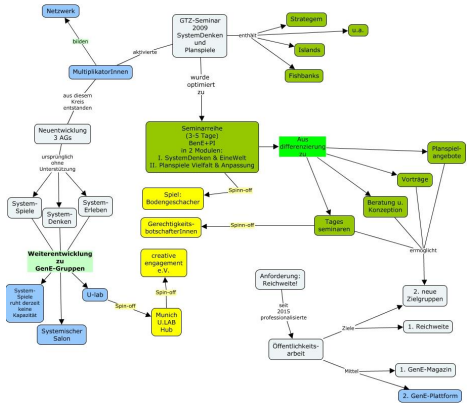


Living Systems: Methods

- Hexagon Thinking

Concept Maps

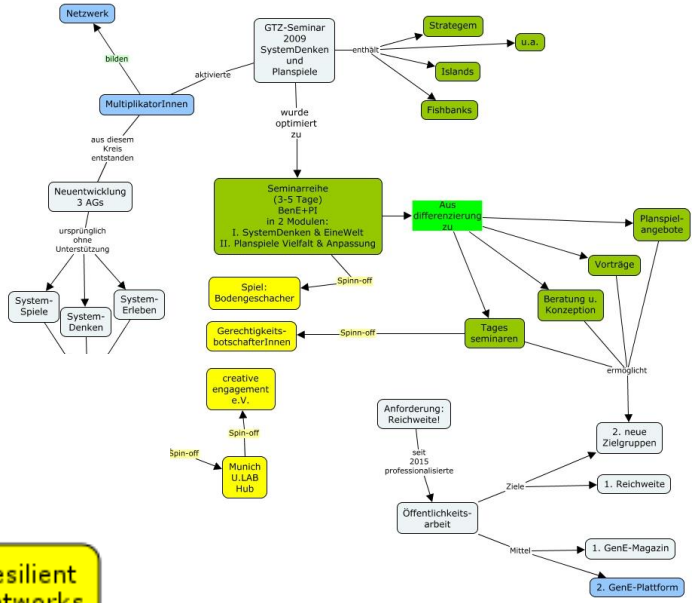


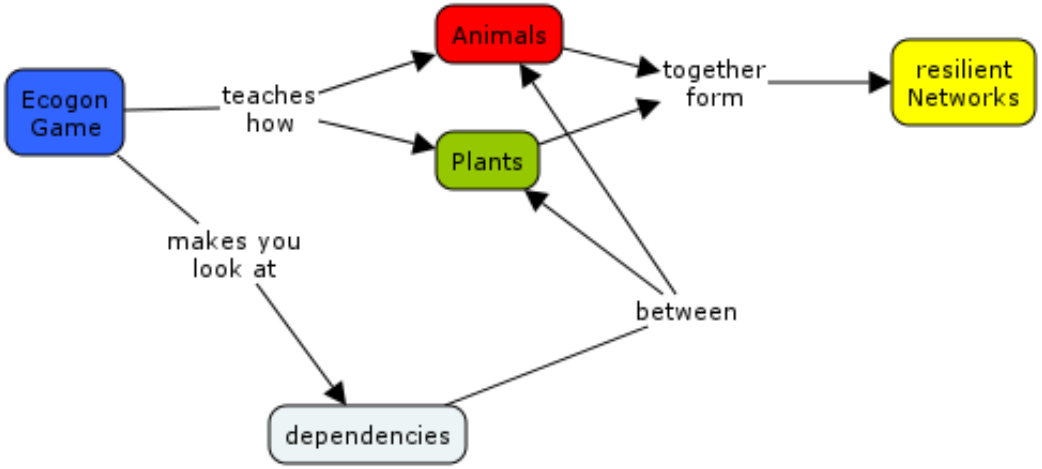


Living Systems: Methods

- Hexagon Thinking

Concept Maps





https://cmapcloud.ihmc.us

Living Systems: Methods

- Hexagon Thinking

  Concept Maps

  Modeling

Living Systems: Methods

- Hexagon Thinking

  Concept Maps

  Modeling

http://www.consideo.com/imodeler24.html

Living Systems: Methods

- Hexagon Thinking
- Concept Maps
- **Modeling**

http://www.consideo.com/imodeler24.html

Eco Systems of Entrepreneurs

- Gründerzentren – Business Incubators
  - Günter Faltin 1985 German Tea Party ;-)

https://www.entrepreneurship.de

Eco Systems of Entrepreneurs

- Gründerzentren – Business Inc[illegible]s
  - Günter Faltin: Kopf schlägt Kapital
  - Universities

Eco Systems of Entrepreneurs

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https://greencitysolutions.de/en/benefits/

Eco Systems of Entrepreneurs

- Gründerzentren – Business Incubators
  - Günter Faltin: Kopf schlägt Kapital
  - Universities
- Alternatives
  - Three Horizons Model
  - Social
  - Platform

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- Three Horizons Model

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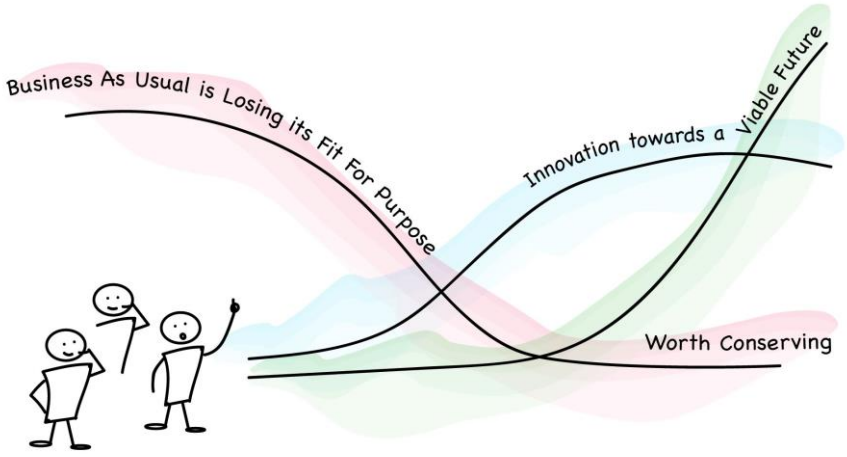
- Three Horizons Model
- The future can be perceived through three lenses:



Map what to let go of, what to conserve, & transformative innovation to reach a shared vision.

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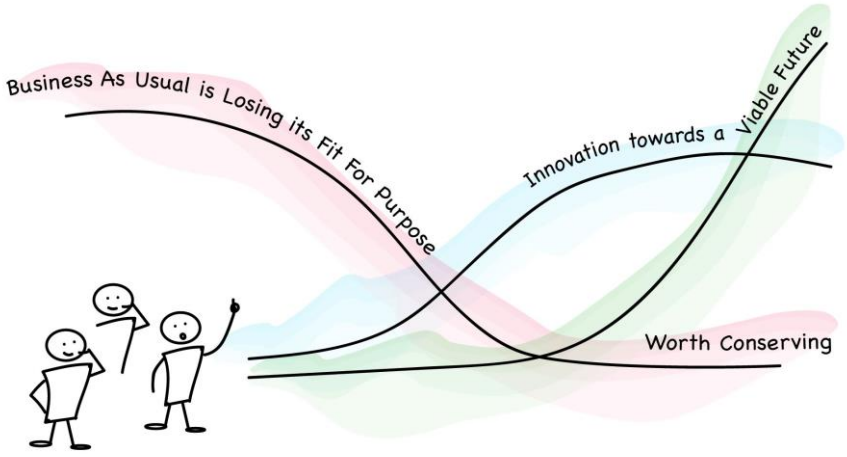

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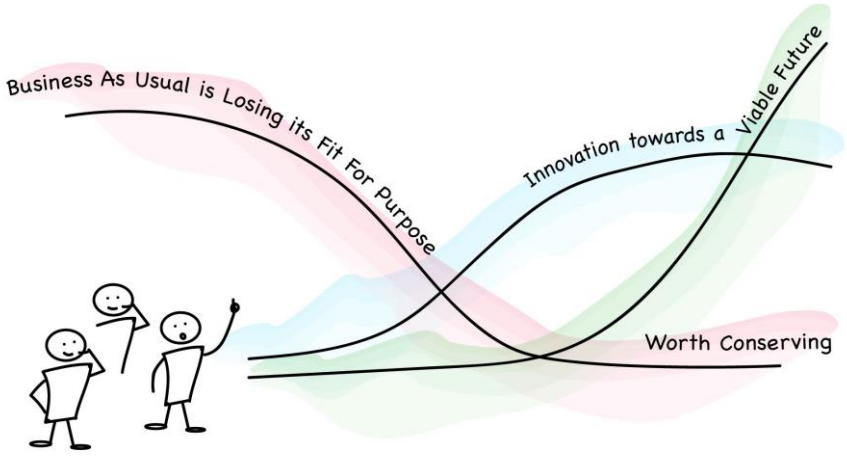

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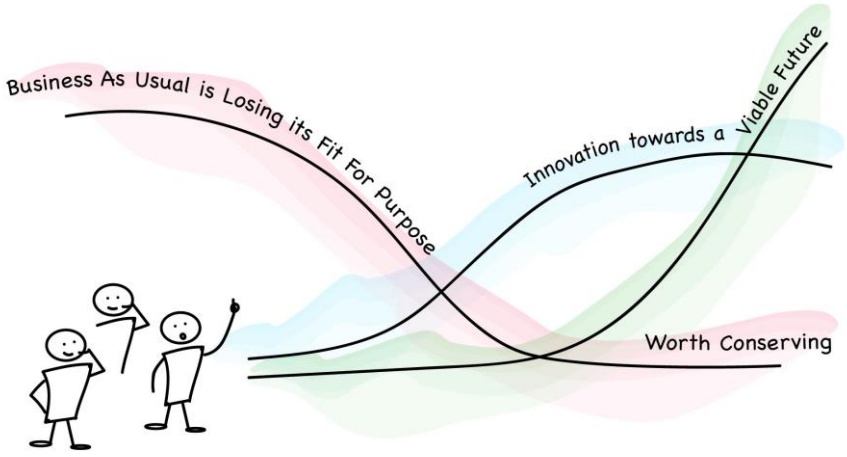
  Horizon 2: Innovation towards the Vision



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http://www.h3uni.org/practices/foresight-three-horizons/

Eco Systems of Entrepreneurs @School

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  - Games
  - Projects

https://www.youtube.com/watch?v=pkjLf6SuTPw