NPP management challenges and characteristics of learning organisations in five European countries

LearnSafe Final Seminar 28th – 29th April 2004

Jari Kettunen, Teemu Reiman
VTT Industrial Systems

Bethan Jones
Lancaster University Management School

LearnSafe

Outline

- Data
- **MetaFuzz**
  - Method
  - Analysis
  - What Can We Learn?
- **Content Analysis**
  - Method
  - Analysis
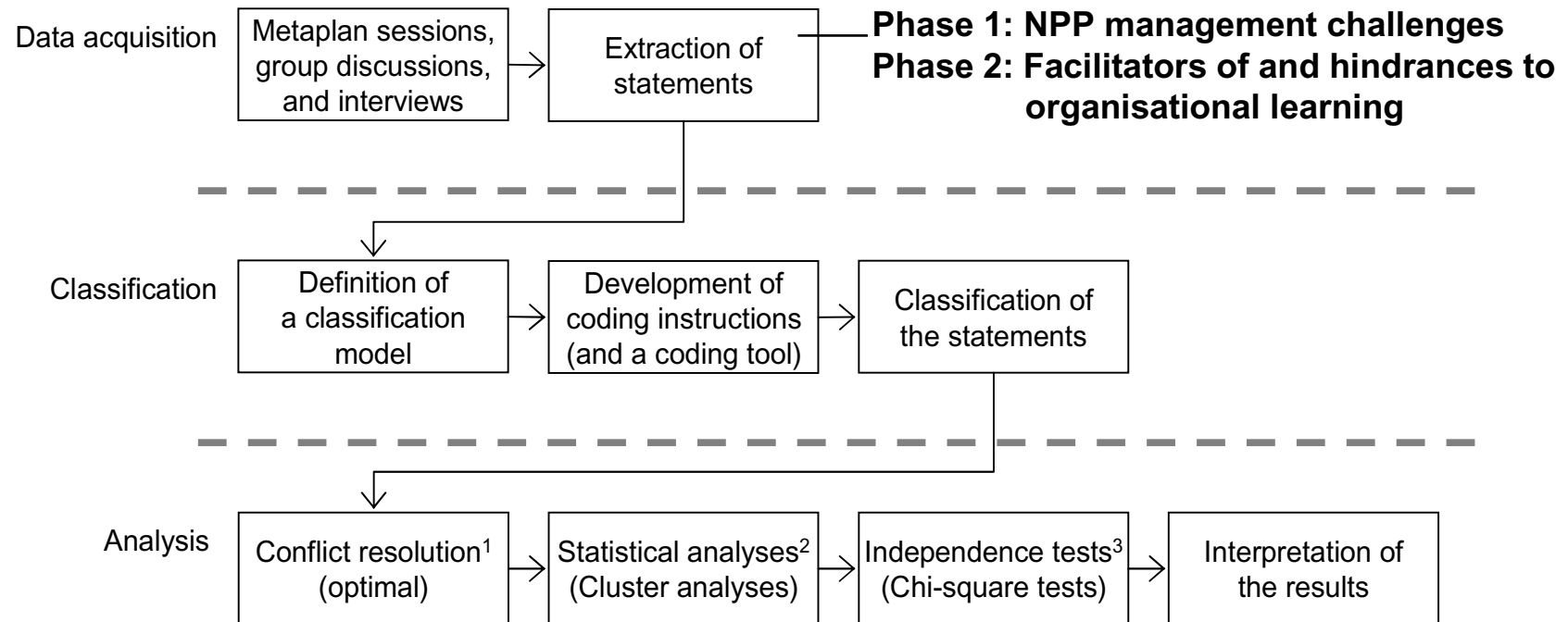 - What Can We Learn?
- Conclusions

Data

PHASE 1

- **Semi-structured interviews** with 11 top utility management from 6 utilities within 5 European countries.

- 19 **metaplan sessions** with senior and multifunctional NPP mangers at 10 NPPs within 5 European countries and1 session at WANO.

PHASE 2

- **Semi-structured group interviews** with 36 participants from 8 NPPs within 5 European countries.

- 11 **metaplan sessions** at 9 NPPs within 5 European countries and 1 session at Head's of Safety and Environment Meeting in the UK.

- 11 **discussion sessions** at 9 NPPs within 5 European countries and 1 session at Head's of Safety and Environment Meeting in the UK.

The MetaFuzz Approach

Data acquisition

| Metaplan sessions, group discussions, and interviews | → | Extraction of statements |

Phase 1: NPP management challenges
Phase 2: Facilitators of and hindrances to organisational learning

- -

Classification

| Definition of a classification model | → | Development of coding instructions (and a coding tool) | → | Classification of the statements |

- -

Analysis

| Conflict resolution[1] (optimal) | → | Statistical analyses[2] (Cluster analyses) | → | Independence tests[3] (Chi-square tests) | → | Interpretation of the results |

1) For diminishing deviations in the classified data (if N is reasonably low)
2) For establishing a feasible structure for the underlying data
3) For studying whether the new clusters and selected background variables are related

Learn Safe

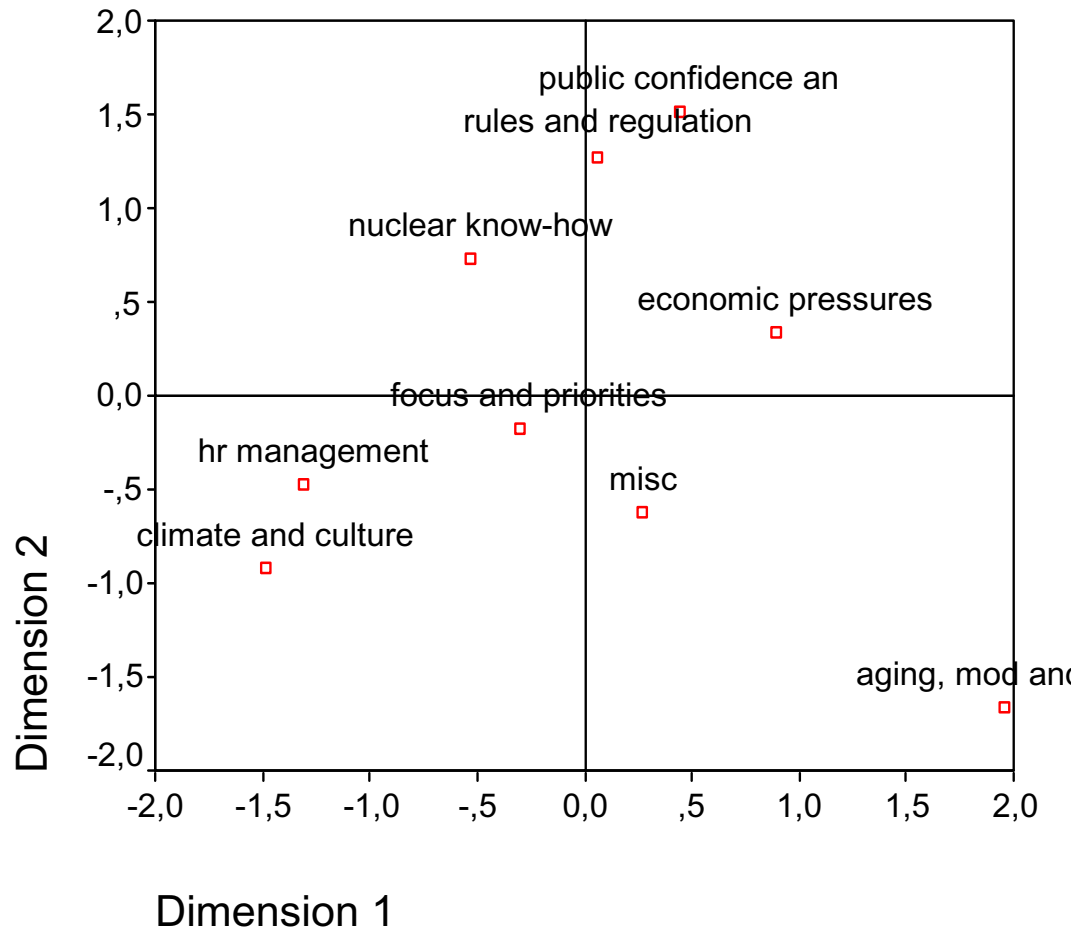# Classification of the Data

PHASE 1

- A **five-dimensional** classification model
    - **Economic and financial**
    - **Workforce and competence**
    - **Technology**
    - **Systems and procedures**
    - **Environment**
- The five dimensions were assumed to cover the general characteristics of NPP managers' job

PHASE 2

- A **four-dimensional** classification model
    - **Individual**
    - **Social**
    - **Systems and procedures**
    - **Objectives and priorities**
- The four dimensions were assumed to incorporate the generic issue domains of organisational development work

LearnSafe

Derived Stimulus Configuration

Euclidean distance model

Dimension 1

Dimension 2

public confidence an

rules and regulation

nuclear know-how

economic pressures

focus and priorities

hr management

misc

climate and culture

aging, mod an

Phase 1 Analysis 9-cluster solution

1. Economic pressures
2. Human resource management
3. Nuclear know-how
4. Rules and regulation
5. Focus and priorities
6. Ageing, modernisation and new technologies
7. Public confidence and trust
8. Climate and culture
9. Miscellaneous

Phase 1 Analysis
The Largest Clusters

- **Human resource management (22,3%)**
  - maintaining competency
  - age distribution of personnel
  - early retirement
  - recruiting
  - maintaining specialised nuclear competency, etc.
- **Climate and culture (17,4%)**
  - motivation and attitudes
  - safety culture
  - fighting complacency
  - mental and emotional strain
  - organisational and human factors, etc.

- **Public confidence and trust (12,8%)**
  - societal acceptability of nuclear power
  - irrationality in anti-nuclear attitudes
  - hostility in mass media
  - distrust in local or regional authorities
 - an accident anywhere is an accident here, etc.

Phase 1 Analysis
Cross-tab of Country and Cluster

NO.	CHALLENGE CLUSTER	FIN	GER	INT	SP	SWE	UK	Rf.
1	Economic pressures	0	15,8	18,8	11,2	12,2	3,6	10,3
2	HR management	21,4	18,4	8,3	18,7	28,9	26,2	**22,3**
3	Nuclear know-how	5,4	10,5	4,2	8	10,6	3,6	7,8
4	Rules and regulation	1,8	5,3	2,1	8	6,1	7,1	6,1
5	Focus and priorities	16,1	7,9	14,6	3,2	10,6	15,5	9,6
6	Ageing, modernisation and new	17,9	13,2	8,3	3,2	9,4	11,9	8,8
7	Public confidence and trust	10,7	5,3	18,8	20,9	10,6	1,2	**12,8**
8	Climate and culture	21,4	15,8	6,3	23,5	8,3	27,4	**17,4**
9	Misc.	5,4	7,9	18,8	3,2	3,3	3,6	5,1
Total		100,1	100,1	100,2	99,9	100	100,1	100,2

Cluster and Country are *dependent* (Chi-square = 127,38, df = 40, p < 0,001).
Interpretation: Different management challenges are emphasised in different
Countries, although there are also common denominators, such as HR
Management, and climate and culture.

Derived Stimulus Configuration

Euclidean distance model
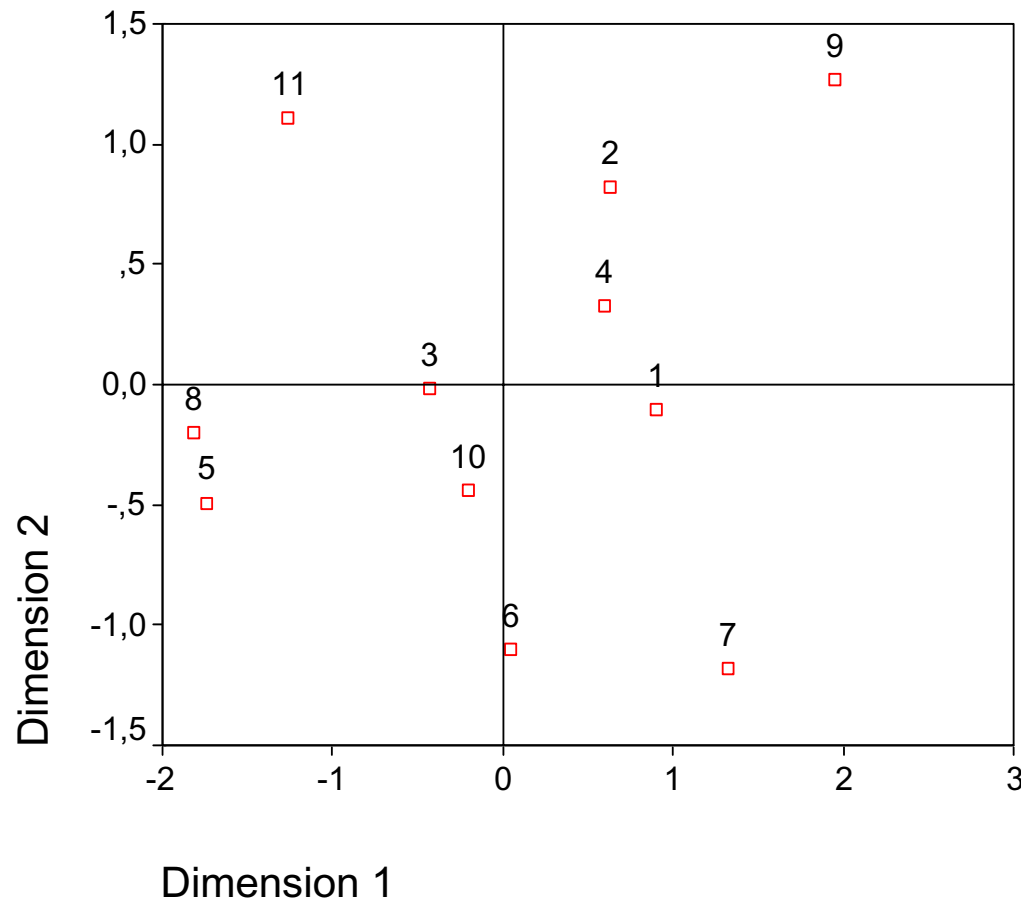
Phase 2 Analysis 11-cluster solution

1. Communication, guidance and appraisals
2. Networking and co-operation
3. Work community
4. Miscellaneous
5. People's attitudes and orientation
6. Maintaining touch and focus
7. Objectives, priorities and resources
8. Openness and trust
9. Formal systems and practices
10. Encouragement and rewards
11. Corporate culture and traditions

Phase 2 Analysis
The Largest Clusters

- **Objectives, priorities and resources (13,1%)**
  - lack of time is partly dependent on an uneven loading and partly on difficulties to set priorities (H)
  - company management has a short-term focus (H)
  - an organisation that is successful at learning is able to prioritise and to look to external bodies for support i.e. WANO, INPO, etc. (F)
  - the organisation has decided on what's important and it has been broken down to a level where it is understood (F)
  - keeping away "cul-de-sac" projects but fashionable (F)

- **Work community (12,4%)**
  - positive past experiences can also have an impact in that when an organisation is doing well its employees may not be motivated to learn (F)
  - acknowledging personal contribution (F)
  - aged organizations (H)
  - too much time in the same job (H)
  - reluctance to think in systems (H)

Learn Safe

Phase 2 Analysis
Generic Themes

META CL.	NAME	Presence in the five executed clustering solutions				
		5	6	11	6(F)	7(H)
A	Objectives, priorities and resources	X	X	X	X	X
B	Formal systems and practices	X	X	X	X	X
C	People's attitudes and orientation	X	X	X		X
D	Corporate culture and traditions	X	X	X	X	X
E	Communication, guidance and appraisals			X	X	X
F	Maintaining touch and focus		X	X		X
G	Openness and trust			X		X
H	Work community	X		X	X	
I	Encouragement and rewards			X	X	
J	Miscellaneous			X		
K	Networking and co-operation		X	X		

LearnSafe

Phase 2 Analysis - Cross-tab of Cluster and Country (all statements)

Metaclusters	FIN	GER	SP	SWE	UK	Rf.
A. Objectives, priorities and resources	12,10	10,45	20,55	13,31	9,52	**13,10**
B. Formal systems and practices	10,48	23,88	5,48	9,42	7,94	**10,77**
C. People's attitudes and orientation	12,90	7,46	12,33	5,84	4,23	7,77
D. Corporate culture and traditions	8,87	5,22	2,74	6,82	6,88	6,22
E. Communication, guidance and appraisals	9,68	12,69	13,01	8,12	13,23	**10,88**
F. Maintaining touch and focus	8,06	6,72	2,74	8,77	7,94	7,21
G. Openness and trust	9,68	8,21	4,79	8,77	12,70	8,99
H. Work community	11,29	4,48	15,07	14,29	13,76	**12,43**
I. Encouragement and rewards	4,84	3,73	8,90	7,47	9,52	7,21
J. Miscellaneous	4,84	11,94	7,53	8,12	1,59	6,77
K. Networking and co-operation	7,26	5,22	6,85	9,09	12,70	8,66
Total	100,00	100,00	100,00	100,00	100,00	100,00

Cluster and Country are *dependent* (Chi-square = 103,832, df = 40, p < 0,001).
Interpretation: different facilitators of and hindrances to organisational
learning are emphasised in different countries, although there are also clear
common denominators, such as H (Work community) and A (Objectives etc.).

LearnSafe

Phase 2 Analysis - Cross-tab of Cluster and Country (hindrances)

Metaclusters	FIN	GER	SP	SWE	UK	Rf.
A. Objectives, priorities and resources	22,73	21,79	22,54	23,27	12,77	**20,73**
B. Formal systems and practices	7,58	24,36	4,23	15,72	8,51	12,82
C. People's attitudes and orientation	16,67	11,54	21,13	8,18	5,32	11,32
D. Corporate culture and traditions	7,58	8,97	1,41	6,92	11,70	7,48
E. Communication, guidance and appraisals	19,70	17,95	21,13	15,72	22,34	**18,80**
F. Maintaining touch and focus	9,09	6,41	14,08	16,98	13,83	13,03
G. Openness and trust	16,67	8,97	15,49	13,21	25,53	**15,81**
Total	100,00	100,00	100,00	100,00	100,00	100,00

Cluster and Country are **dependent** (Chi-square = 53,533, df = 24, p < 0,001).
Interpretation: different hindrances to organisational learning are emphasised in different countries, although there are also clear common denominators, such as A (Objectives, priorities and resources) and E (Communication etc.).

LearnSafe

What Can We Learn From The MetaFuzz Analysis?

PHASE 1

- HR management, organisational climate and culture, and attaining public confidence are the key challenges to NPP management across Europe

- The results reflect the practical effects of the ongoing generation turnover and the current status of the industry in many countries

- Economic pressures or technological challenges were not particularly emphasised, possibly due to the dominance of HR management related issues

PHASE 2

- Goal definition, prioritisation and resource allocation have a significant overall impact on the functioning of the organisation and on its ability to learn as well

- Experienced time pressures, which effectively hamper information processing, reflection and learning, were clearly related to management action

- Factors related to corporate culture or traditions did not appear to play a major role as facilitators of or hindrances to organisational learning

Content Analysis

- **Method**
  - Content analysis involves the definition of key words and phrases, from the generated data, being listed, counted and categorised.
  - Content analysis enables researchers to generate frequencies from qualitative data, whilst maintaining its richness.

- **Procedure**
  - Conducted using computer assisted qualitative data analysis software (N-Vivo 2.0);
  - Browse and explore the documents;
  - Responses are identified and grouped;
  - References to the text stored within specific nodes labelled to reflect their content;
  - Data is retrieved and reported.

Phase 1 Findings

ECONOMIC AND FINANCIAL (139)	WORKFORCE AND COMPETENCE (356)	TECHNOLOGY (107)	SYSTEMS AND PROCEDURES (140)	ENVIRONMENT (317)
Lack of Resources (28) Corporate Pressures (13) Deregulation and Competition (20) Mergers and Acquisitions (7) Shorter Outages (5) Decommissioning (7) Management of Resources (34) Reduction in costs (9)	**Generation Turnover and maintaining SQEP (173)** **Personnel management and policies (76)** Recognition of the importance of human factors (16) **Attitudes and health (72)**	Ageing Technology (32) New Technology (26) Safety and Maintenance (28) Competence (13)	Excessive (21) Inefficiencies and Difficulties (25) **Management Priorities (51)** Responsibility (7) New Requirements (12) Modernisation (3)	**Attractiveness of the Industry (121)** Sabotage and Terrorism (14) Global Perception (11) Distrust and Hostility (13) Public Opinion (25) **Regulator (68)** Political Climate (26) Tension in the Sector (20)

LearnSafe

Phase 2 Findings

FEATURES AND ATTRIBUTES OF LEARNING ORGANISATIONS (254)		
Structural (112)	Psychological (59)	Support systems (83)
Questioning and challenging approach (12) Dissatisfied with the present situation (8) LS Model (17) **Learn from self and others (22)** Time and patience (8) Visible benefits (7) **The learning process (25)** Organisational focus (13)	Empowerment (10) Trust (5) Communication (15) **Culture (20)** Motivation (9)	**Formal (53)** **Informal (30)**

Phase 2 Findings

BARRIERS TO ORGANISATIONAL LEARNING (476)				
Individual (181)	Management (164)	Organisation (57)	Culture (51)	External Pressures (23)
Behaviour – Routine and Turnover (28) – **As an agent for OL (33)** – Communication (30) – Competency (7) – Insularity (7) Attitudes – Resistance to change (24) – Trust (5) – Motivation (26) – Self-conceit and attitude towards others (21)	**Focus and Priorities (42)** Decision making (10) Commitment (6) Responsibilities and guidance (27) **Workload, time and resources (61)** Management of change (18)	Technology (8) Strategic learning and training (4) Support and tools (17) Structures and procedures (28)	Not invented here (7) Influence of the past (11) Sub-cultures (15) Trust (3) Defensive and critical (15)	Social (3) Political (5) Regulator (9) Competition (6)

Phase 2 Findings

REMOVAL OF BARRIERS (192)				
Individual (63)	Management (57)	Organisation (48)	Culture (18)	External (6)
Communication (13) **Participation and benefit (27)** New personnel and job rotation (15) Sensitivity (3) Information overload (5)	**Clarification of Focus and Priorities (42)** Management of change (14) Clarification of responsibilities (11)	**Methods and tools to support OL (29)** Clear procedures (6) Allocation of time and resources (13)	Recognition (7) Continuous Learning (6) Trust (5)	Society (4) Regulator (2)

CULTURE/ SUB-CULTURES INFLUENCE ON ORGANISATIONAL LEARNING (55)		
Leadership focus (25)	Change management (9)	**Group differences (21)**

LearnSafe

What Can We Learn From The Content Analysis?

PHASE 1

- Issues related to the workforce and levels of competence were considered the most important challenges

- Challenges occurring within the environment over which senior managers have little of no control were also considered to be important

- While technological challenges were considered the least important

- There was agreement between countries on the key challenges

- Senior mangers believed workforce and competence issues to be the most challenging while top utility managers identified challenges within the environment as being the most pressing

PHASE 2

- Structural features of learning were identified as the greatest facilitators of organisational learning

- The biggest barrier to the development of a learning organisation was workload, time and resources

- Clarification of focus and priorities considered the best way of removing barriers to learning within the organisation

- There was agreement across the various groups on the key facilitators and barriers to organisational learning

LearnSafe

Overall Conclusions, Phase 1
NPP management challenges

- Key challenges
  - Maintaining competence, building motivation and assuring a good organisational climate
  - Maintaining public confidence, enhancing the attractiveness of the industry
- How to manage?
  - Need to invest in succession planning, recruitment and HR management in general
  - Need to assure good safety performance under all circumstances

Overall Conclusions, Phase 2
Organisational learning

- Key hindrances to organisational learning
  - Excessive workload, no time for reflection
  - Insufficient communication and guidance
- How to manage?
  - Clarify and communicate focus and priorities
  - Resources and priorities must be commensurate