Enabling quality qualitative data analysis with evidence through NVivo for interdisciplinary research (Part I)

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Declaration

- User of NVivo [sharing experience but not promoting NVivo as the only tool for qualitative analysis]

- Some images with sources are extracted from Google search for educational purpose

Intended learning outcomes

The workshop is planned for you who are new to NVivo, a qualitative analytic software to acquire fundamental skill in various stages of conducting literature review, collecting data from various stakeholders, data processing and report writing of a research project. The software can process document in PDF, Word and Excel format if you consider to documenting literature (PDF), transcribing interviews (Word) and conducting survey (Excel). In the workshop, you will learn **how to do coding** first with no themes, how to link related coding as 'Tree' and 'Nodes' which will form parts of the **emerging themes** with the software.

Agenda

- Conceptual understanding of qualitative research

- NVivo overview

- Illustration on some basic steps in Nvivo
    - Coding
    - Managing nodes
    - Making queries after coding

- Hands-on practice using NVivo for qualitative research

Educational research

Research Questions:

What are the impacts on student learning when they conduct peer assessment?

What are the benefits of adopting flipped classroom in my teaching?
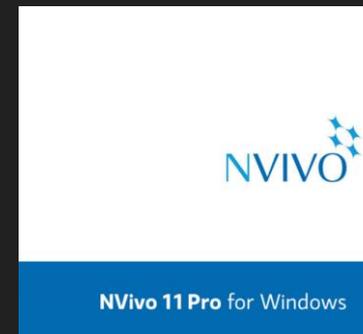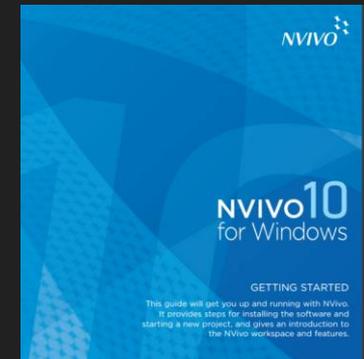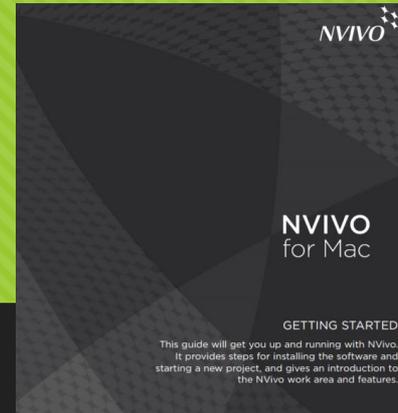
My experience

- Using Nudist / NVivo for my doctoral study – individual interviews with academics and staff developers from five institutions
  - Coding
  - Queries
  - Retrieving direct quotes as evidence in writing dissertation
- Using NVivo for one of my projects – focus group interviews with students (local and non-local students including mainland students and overseas students) from three institutions
  - Coding
  - Queries
  - Comparing cases
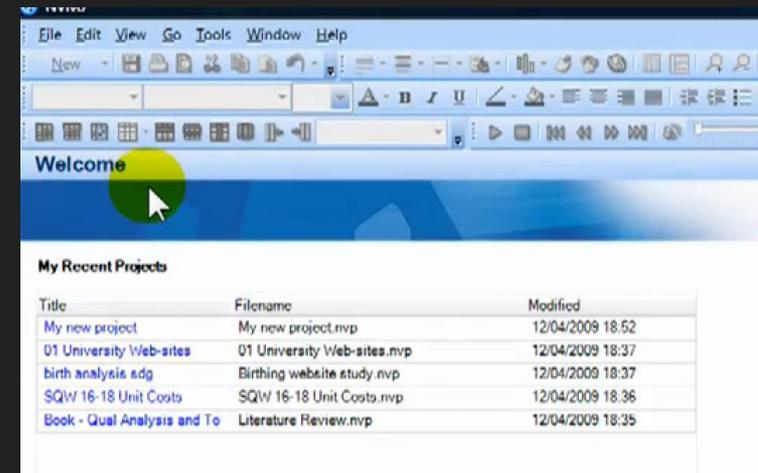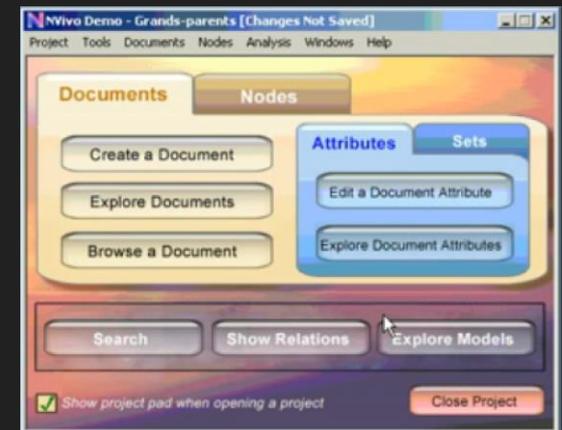
Your experience

1. Conduct interviews [one-to-one, focus group]
2. Transcribe interviews
3. Code interviewing scripts
4. Make annotations of interviewing scripts
5. Create a summary of interviews
6. Use software for qualitative research

Designed by Katemangostar - Freepik.co

Quantitative > Qualitative research methods

Quantitative research

- Hypotheses
- Quantifiable data
- Used for factor analysis, confirming factors, making generalization and prediction
- Significance testing

Qualitative research

- Case by case
- **Making inquiry (what, how & why)**
- Qualitative data from **a variety of sources and formats**
- Include field observation, interviews (individual / group)
- Narrative account; explanation; phenomena

Theories in use

Comparison of Qualitative Analysis Approaches

	General Inductive Approach	Grounded Theory	Discourse Analysis	Phenomenology
Analytic strategies and questions	What are the core meanings evident in the text, relevant to evaluation or research objectives?	To generate or discover theory using open and axial coding and theoretical sampling	Concerned with talk and texts as social practices and their rhetorical or argumentative organization	Seeks to uncover the meaning that lives within experience and to convey felt understanding in words
Outcome of analysis	Themes or categories most relevant to research objectives identified	A theory that includes themes or categories	Multiple meanings of language and text identified and described	A description of lived experiences
Presentation of findings	Description of most important themes	Description of theory that includes core themes	Descriptive account of multiple meanings in text	A coherent story or narrative about the experience

Defined framework

Defined framework

- Working on established framework / theories

- RQs

- Methodologies

- Examining sets of data based on **deductive approach**

- Comparing current data with established theories


Deductive Reasoning

EXPERIMENT

↑

Predictions

↑

THEORY
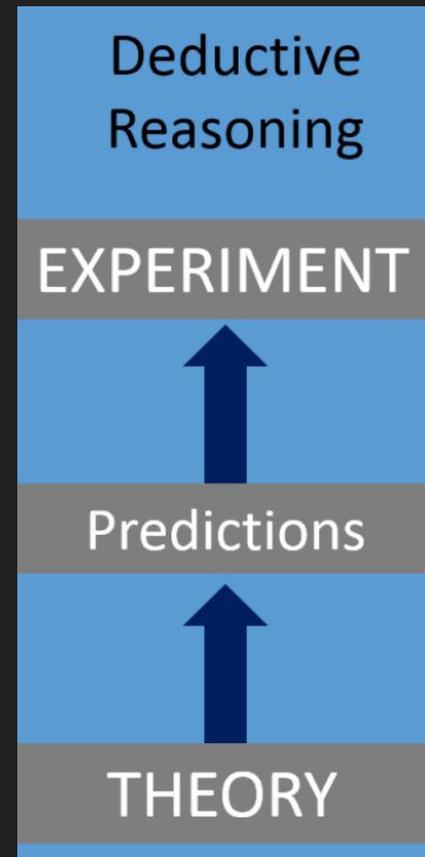
Conceptual framework: Example 1
(Blended learning on part-time degree program)
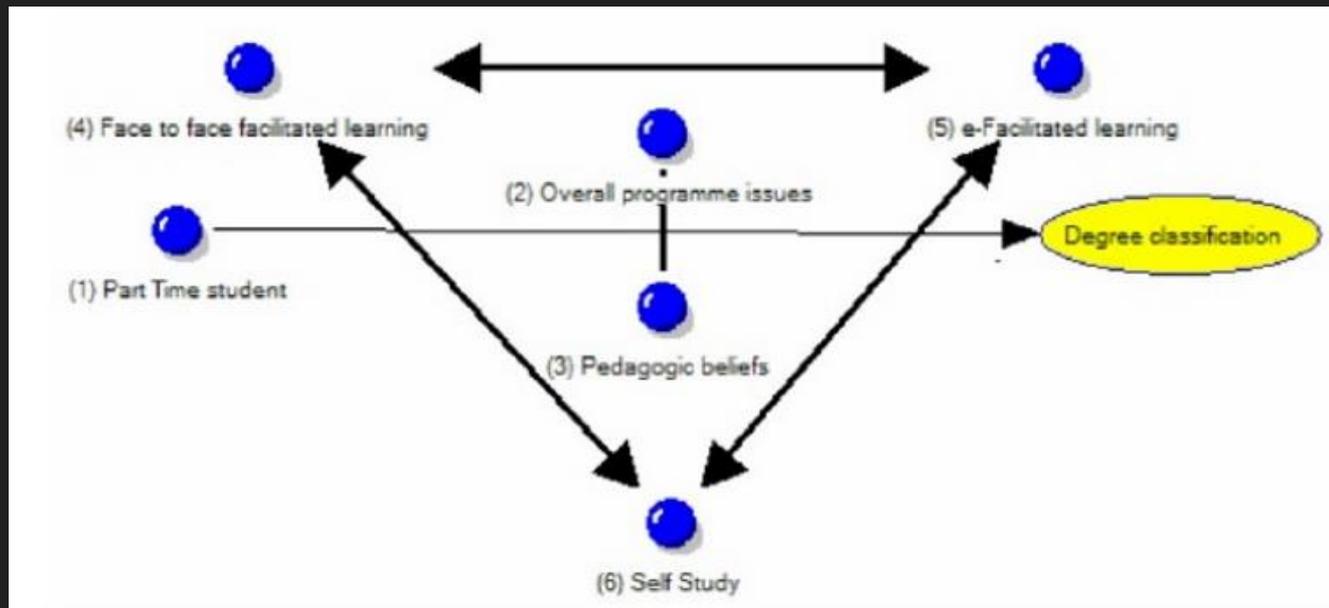
Conceptual framework: Example 2 (Analysis of integrated health care network)

CONTEXT

Macro-level: policy goals on equity, efficiency, and continuity
policy strategies to develop IHN
resource allocation methods

Micro-level: health service supply in the area
characteristics of enrolled population

PROCESS

- Goals and strategies
- Culture
- Health care model
- IHN
- Organizational structure
- Internal resource allocation

OUTCOMES

Intermediate:
Coordination
Continuity of care
Access

Final:
Equity of access
Efficiency

Data sources

	RQ1	RQ2
Primary source of data	Interview [patient]	Survey [e.g. consumers in district]
Secondary source of data	Report in council	Journal articles

Image source: https://medinform.jmir.org/2013/1/e3/
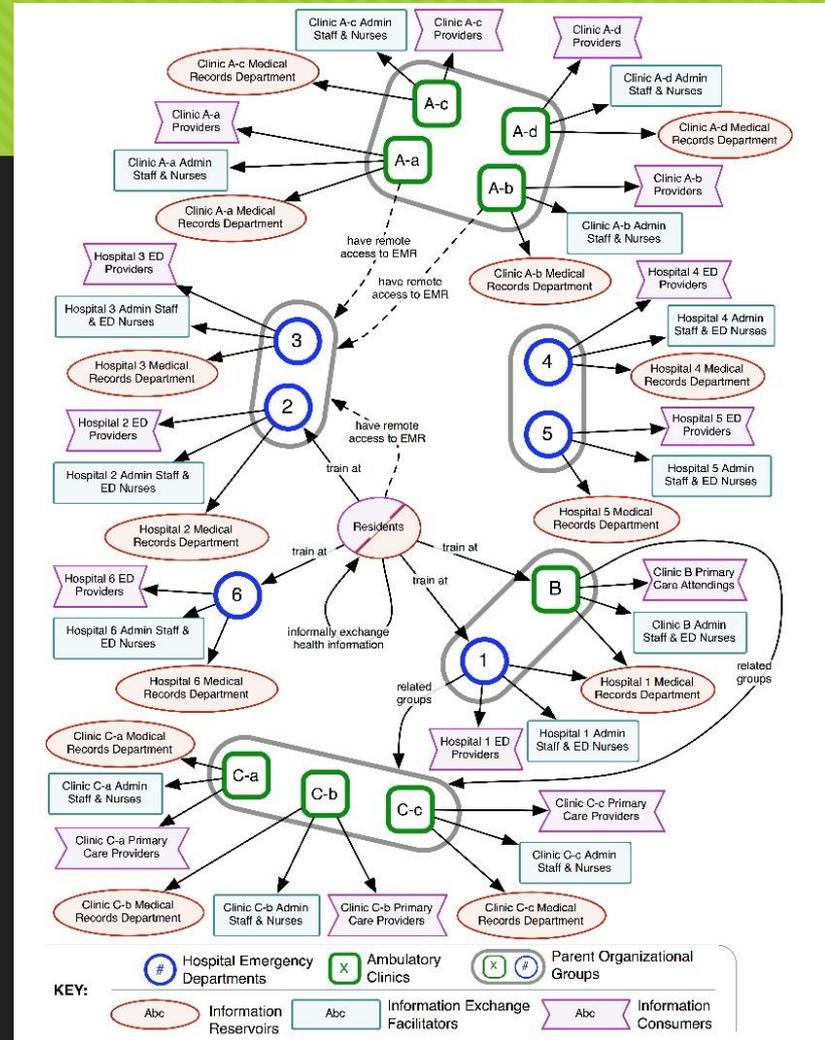
Grounded theory

Coding and **memo-making** from relevant empirical data (Glaser and Strauss, 1967)

Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine de Gruyter.

What is coding?

- Decoding **micro-meaning** from **text** [primary and secondary data]

- Identifying **patterns** of ideations, beliefs and behaviour

- **Conceptualization**

Coding from script

Coding labels

Professional role
Place & Space
Place & Space; Patient experience
Primary-secondary care
Quality of care
Technology

Participant 31: General Practitioner 5

154 I think, sometimes, I think again paediatrics has more in common
155 with General Practice than most specialties, but obviously in General
156 Practice you're looking at the whole person, not just the disease and
157 obviously the good quality Paediatrician does that and if you're
158 seeing people nearer to their home setting, then you can see, you
159 know an outpatient department is a bit remote and I'm not saying
160 it's inhumane but if you are in a setting you're comfortable in,
161 you're going to be more relaxed, you might be more honest and
162 open and give better quality answers particularly if there are social
163 issues. It would be good for consultants to be, you know recognised
164 in a certain area and I think they would appreciate that as well. So
165 no I think, obviously ways in which care could deteriorate are in
166 terms of records because obviously if the consultant doesn't have
167 the notes, that's a disaster, so I don't know what the IT set up would
168 be like, that would, you know obviously if the consultant can access
169 notes remotely whatever you're planning, that would be very, very
170 important.

Coding from script to theory

TEXT | **CODE** | **CATEGORY** | **THEORY**

Image source: https://www.youtube.com/watch?v=phXssQBCDls

Defined/**Open** framework

Defined framework

- Working on established framework / theories
- RQs
- Methodologies
- Examining sets of data based on **deductive approach**
- Comparing current data with established theories

Open framework

- Exploring emerging theories
- RQs
- Methodologies
- Developing a set of codes purely based on **inductive approach**
- Identifying emerging issues or framework for further research

Exploratory study: an example

Pharmacist coding tree

[47 full-time/ part-time pharmacists using NVivo for analysis]
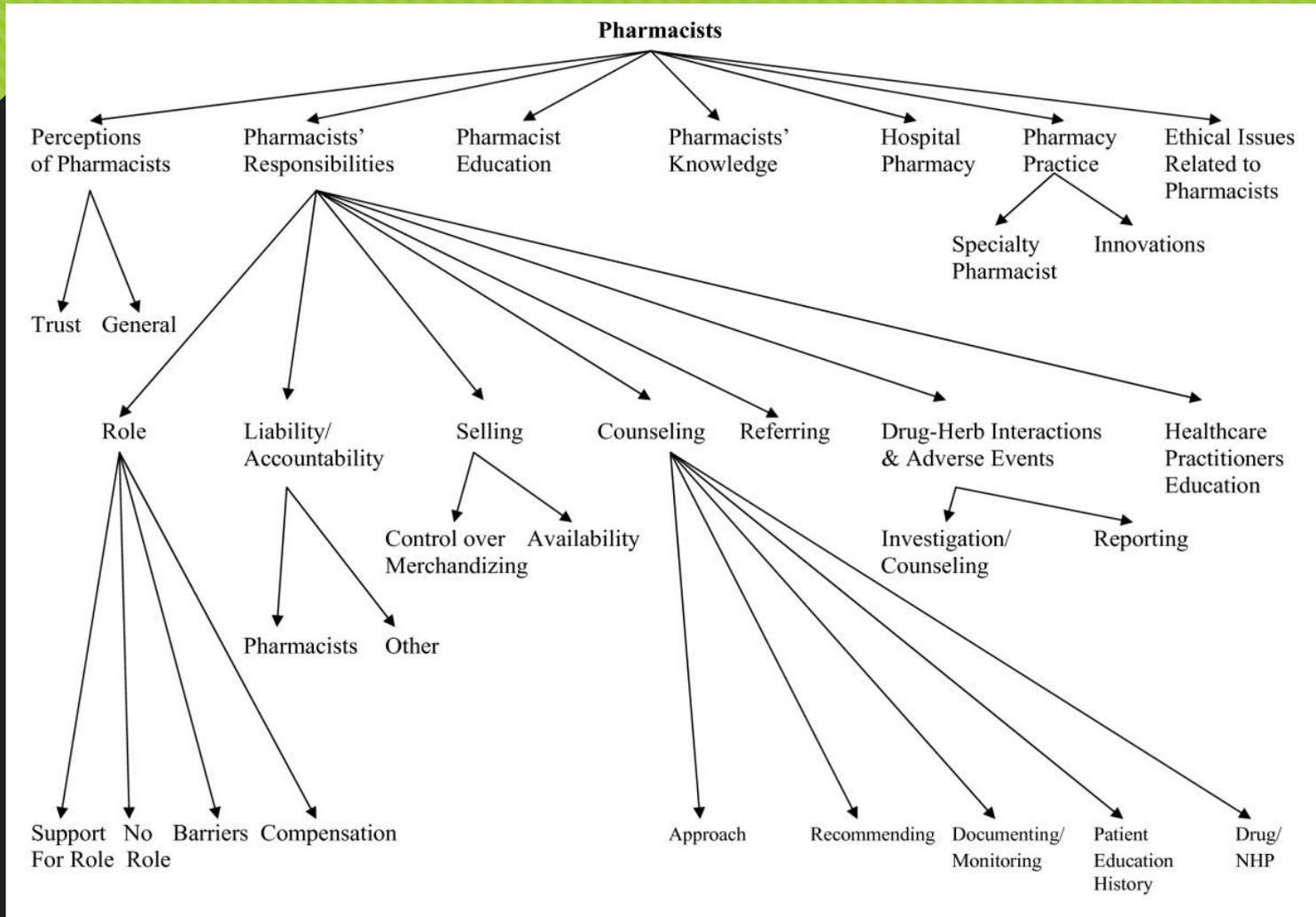
Exercise: Generating sub-themes in an interview (1)

Think about sub-themes relating to the interview

Exercise: Generating sub-themes in an interview (2)

Keywords

- Exchange programmes
- International students
- …

Categories

- Experience [DO; impact]
- Satisfaction [FEEL]
- Implication [Prediction; policy review]
- …

- Depending in the context of disciplines and research questions

Agenda

- Conceptual understanding of qualitative research

- **NVivo overview**

- **Illustration on some basic steps in NVivo**

  - **Coding**

  - **Managing nodes**

  - **Making queries after coding**

- Hands-on practice using NVivo for qualitative research
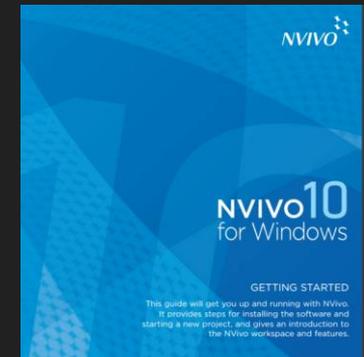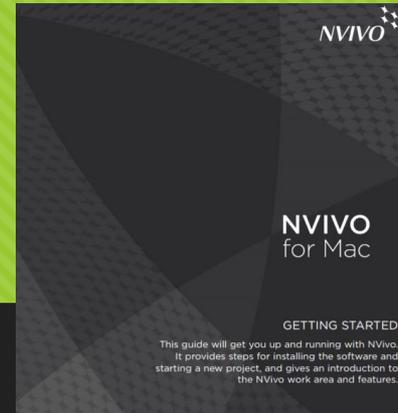
NVivo: a tool to support organization and analysis of data

Working in qualitative research: Managing messy and massive data

Note about using NVivo

- PC & Mac

- Version 10; Version 11 [starter, professional, plus]

- Project created from different platforms may **not** be transposed

  [http://help-nv11mac.qsrinternational.com/desktop/deep_concepts/work_with_your_projects_on_windows_or_mac.htm#MiniTOCBookMark6]

NVivo 10 & 11 (PC)

NVivo 10
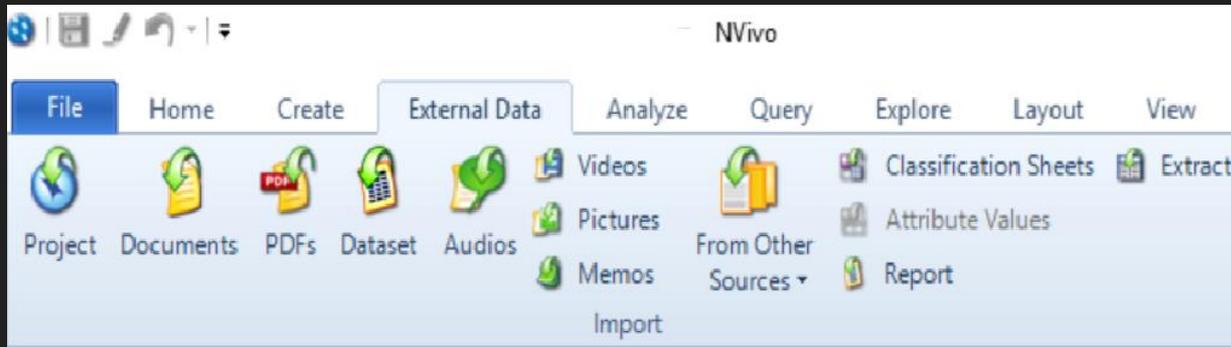
NVivo 11 Pro
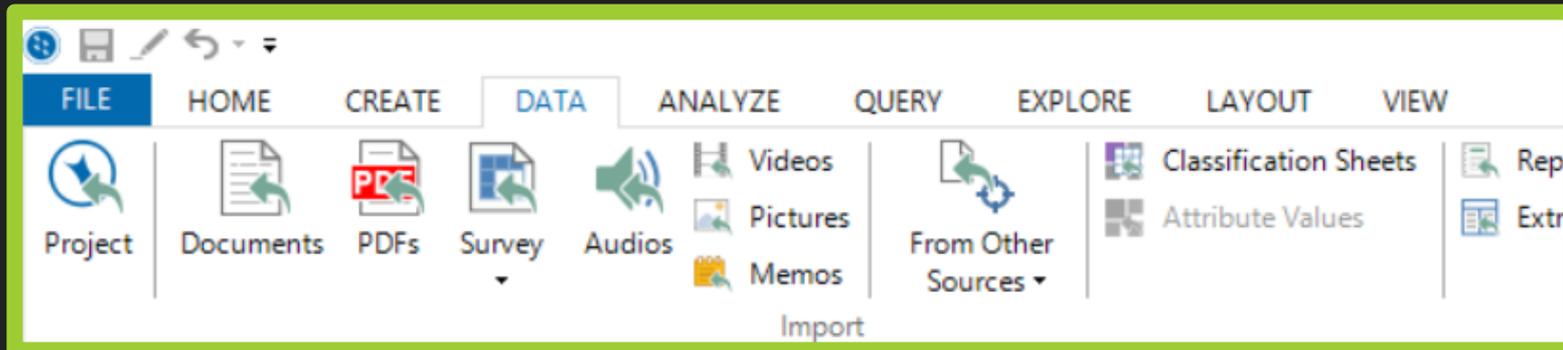
NVivo 10 & 11 (Mac)

NVivo 10

NVivo 11

NVivo overview

gather → import → explore & analyze → visualize & share
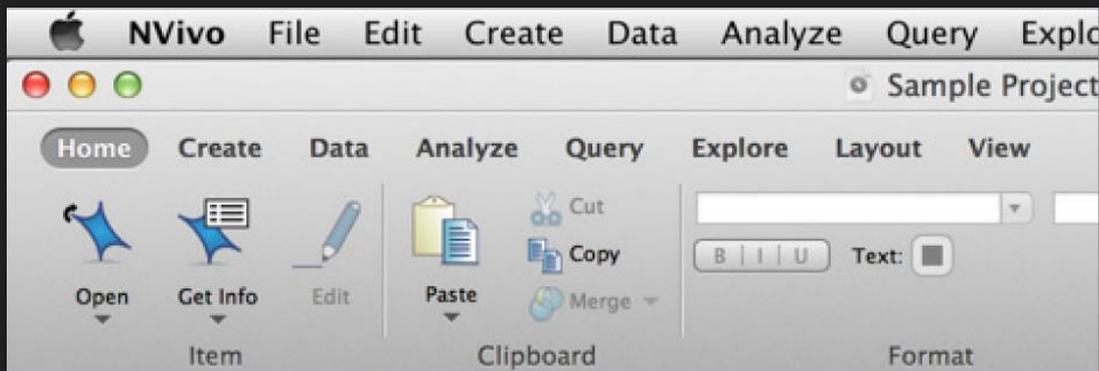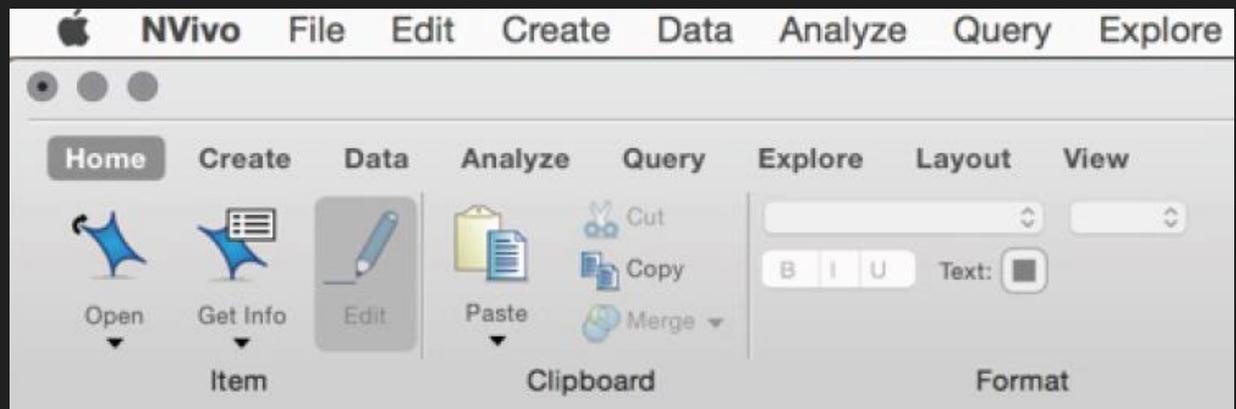
- ○ Importing data
  - ○ [https://goo.gl/sbPDx5] importing document
  - ○ [https://goo.gl/zPSKxK] importing dataset [check whether column as classifying field or codable field]

Import a file [Word/Excel/PDF]

Word

I: expectations developing skills and knowledge on caring of patients through simulation.

Q: are resources provided enough?

S1: there are a lot of references but did not read all of them; **read the key information** sheet only

S2: the teacher provided additional web resource and I have **read them**. They are rel[...] in SPS. It is very clear to me about **brain attack with thrombolytic therapy**

S3: have NOT read the web references, but have **read** the key information particularly I am not sure what role that I will play

S4: have not read the information provided; but read references that I had gotten a p[...] related cares of the case. Certainly need to prepare before attending SPS.

Excel

ID	g...	...	level_of...	coun...	body
1	m	29	b	AU	I wonder how far the law should go to protect against the snooping media, I have been shocked at how wide spread the phone hacking story has reached in the UK.
2	m	29	b	AU	Question is this: where can a 100 year old egg be obtained? sort of like a chinese delicacy and have proven very hard to obtain in my experience. they're very yummy and have only got some in a food court and once in a private residence, and at a restaurant that couldn't get next time (vague)
3	m	29	b	AU	> Have you ever posted any "newsworthy" information that helped someone > beyond your social circle, for instance? Have you ever benefited from > the information from someone you don't personally know? Have you ever > relayed certain information (by re-sharing, re-tweeting, etc) to > others who have told you later that they benefited from the > information you relayed? if your car gets egged, wash it with a bit of water instead of letting it just dry and having the folic acid or whatever super nutrients eat at the paint which means nothing by now

Content analysis

Manifest

- Component

- Words [language used] with high frequency

Latent

- Interpretation of **underlying** meaning of the text

Raw data (primary / secondary data)

Research questions

- Sampling ~ 10%
- Selected sampling after initial filtering (wrt RQs)
- Bold the central idea from a sentence [without preconceived sub-themes / categories]

Coding (1)

- Starting from Node [Grounded theory]
  - **Creating Node**
    - Select content > right click > new node
    - https://www.youtube.com/watch?v=idv9tILvgWc
  - **Converting Nodes to Parent Nodes and Child Nodes**

    [linking: related, lead to, caused from]

    [contrasting, differentiating]
    - Copy a node to tree node / child node
    - https://www.youtube.com/watch?v=4crQbeHKhtk
- Starting from a **framework/theories**
  - Creating a tree node with child node relating to the framework
    - Select content > select the designated nodes

Coding (2)

Coding unit

- Ideas
- **Keywords [text search and save as nodes]**
  - Health information
  - Digital behaviour
  - Organizational culture
- A phrase [from source]

- Nodes

Coding scheme

- Categories [What]/

  Themes [How: behavioral patterns; processes; capabilities] through aggregation of commonality

Cases

- Stakeholders [individuals, age-groups, gender]; categorized sectors; geographical locations

Coding – Drag and drop

Before Coding – Undock All

Coding with full screen

Coding script in table

Look for [▼]   **Search In** [▼] [Nodes]   **Find Now**   **Clear**   **Advanced Find**

Nodes

○ Peer interactions ✕

Name ✎	Sources	References
⊞ ○ 01 Survey	1	80
○ Nurse-jrnl-FG	1	10
⊞ ○ Patient	2	48
○ Patient simul	2	201
○ Peer interacti	2	2
○ phone hackin	0	0
⊞ ○ Reading	1	2
○ reputable sou	0	0
○ SPS	1	30
○ Uncertainty w	0	0

Drag selection here to code to a new node

<Internals\\Transcript nursing PH unbold> - § 1 reference coded [0.30% Coverage]

Reference 1 - 0.30% Coverage

met in the morning with team members (Preparation)

<Internals\\Transcript University English> - § 1 reference coded [0.20% Coverage]

Reference 1 - 0.20% Coverage

GIS (A)	I enjoy class discussion. For example, in University English I and II taught by the same lecturer, much time was provided for me to discuss with classmates in English. The courses have been useful. As for GCVM Virtual Living in a Virtual World, much **time was given also for reflection and discussion.** Thus the course has been useful and inspiring. Another course I would like to talk about is Public Speaking. I learnt a lot when preparing for speech materials. It's good that we could express our opinions during the lessons.

Coding PDF (text)

- By text

Coding PDF (Region)

By region

Coding video

Coding technique

- Code at an existing node
- Drag and drop coding
- Code at a new node
- Using the Quick Coding bar
- **Code results from queries**
- Using nicknames to speed up coding
- Make a node from selected text (In Vivo code)

Coding strategies

- Keeping coding strips on

- Doing a pilot with a few scripts

- Reviewing the coding system; avoiding many coding on the same script – keeping the dominant themes

- Inserting brief description about a node, example and exclusion – important when work with more than one coders

- Making annotation in text where necessary

# Making annotation [the document] (Ctrl+Shift+Key 'A')
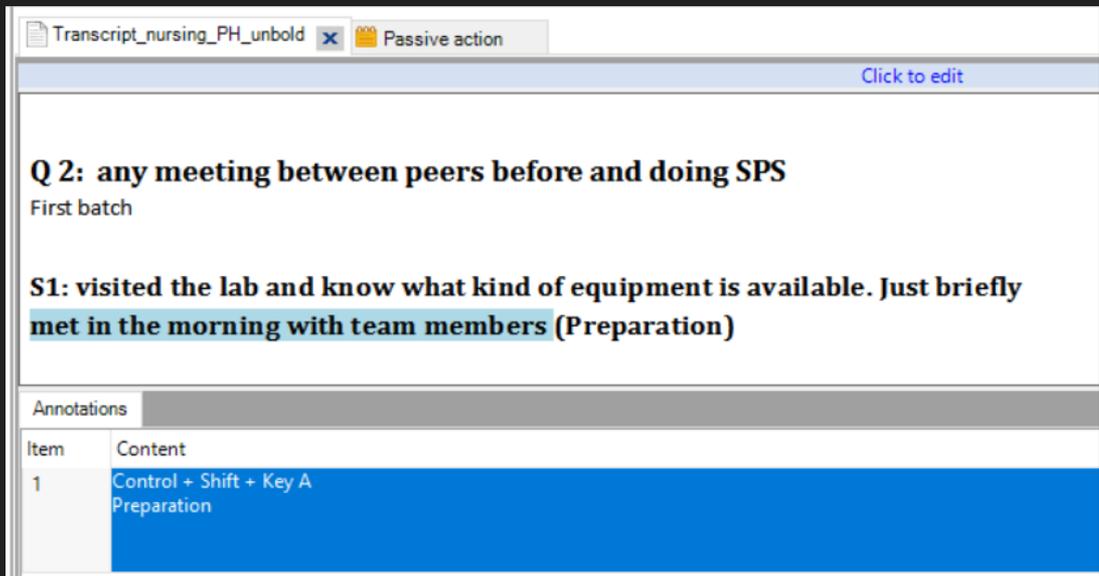
Coding by categories
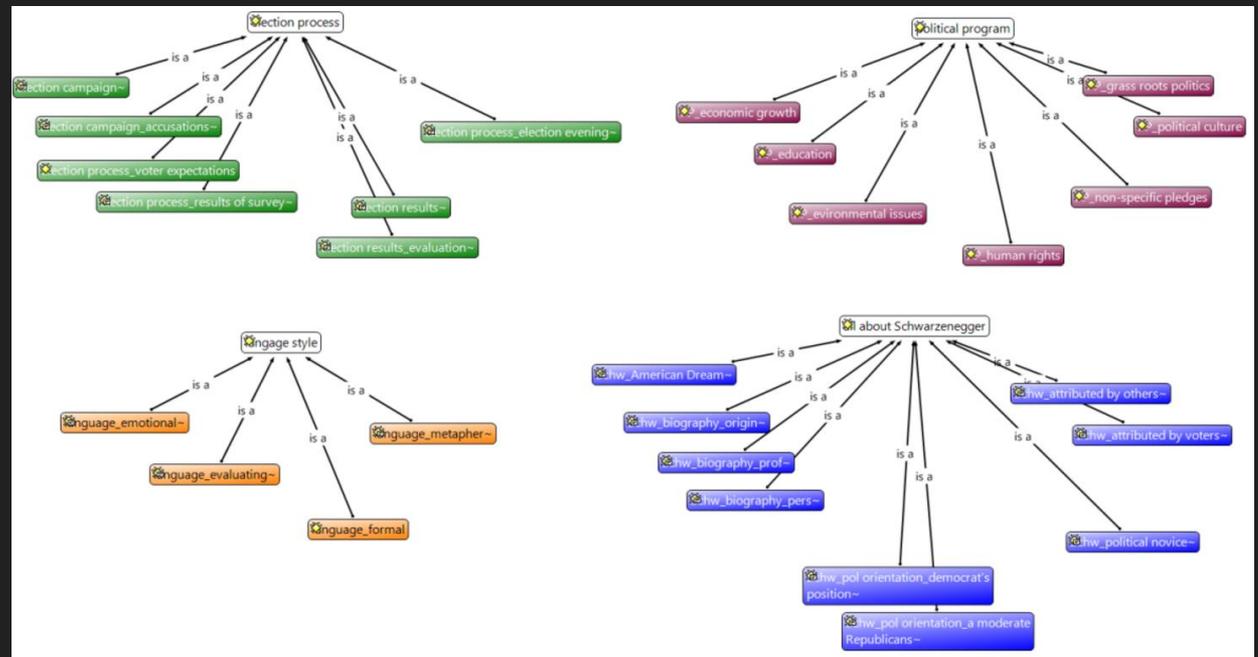
Image source:
http://www.quarc.de/fileadmin/downloads/figures/Figure%207.26_%2
0Developing%20categories%20in%20the%20form%20of%20hierachical
%20trees.png

Categorization example (1)

Theme	LACK OF CONTROL AND STRUGGLE FOR REGAINING CONTROL					
Category	SENSATIONS			ACTIONS		COGNITIONS
Sub-category	Unfamiliar bodily sensations	Familiar but unexpected bodily sensations	Terrible feelings	Unfamiliar actions	Familiar but unexpected actions	Thinking difficulties
Codes	Double vision Emptiness in the head Emptiness in the stomach Stiffness in the tongue Unsteadiness Weightiness in the legs	Enormous hunger Palpitations of the heart Tremor Sweating	Frightened to death Loss of control Uncertainty Confusion	Fumbling Disconnected speech Disruptive behaviour	Urge to eat Verbal expressions of anger "Attack" on the refrigerator	Inability to think clearly Uncertainty of what to say Unawareness of surroundings

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, 24(2), 105-112.

Categorization example (2)
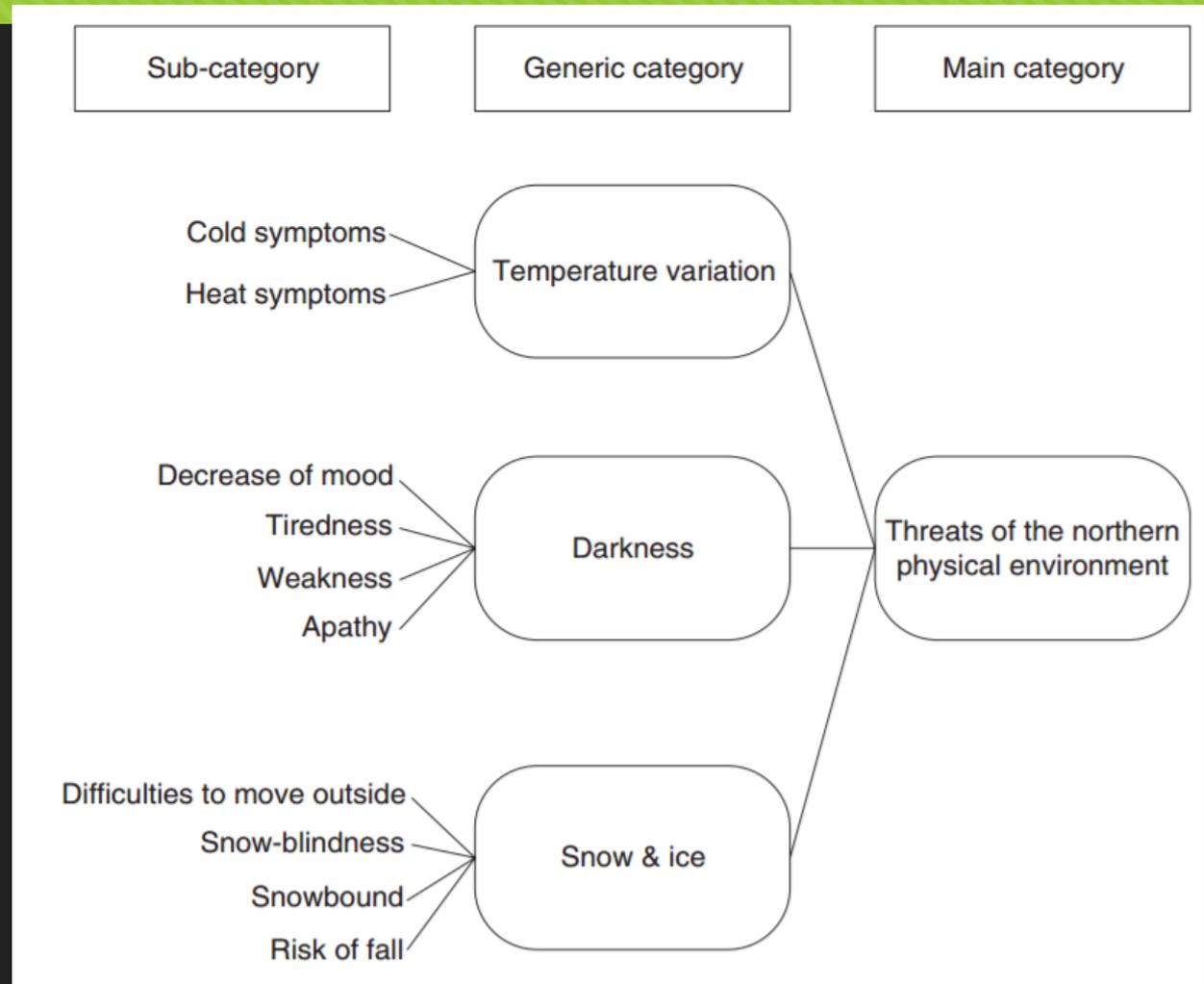
Image source:
https://www.research
gate.net/profile/Satu_
Elo/publication/54993
99_The_qualitative_c
ontent_analysis/links/
02bfe5112a36ee6e8a
000000.pdf

Managing nodes (1)

Organization of nodes

- Drag and drop
  - Form Child node
- Rename
- Delete

Managing nodes (2)

Merging nodes

- Cut the node

- Merge into New Child Node

Managing nodes (3)

Merging nodes

- Cut the node

- Merge into Selected Node

Levels of coding

Image source: http://iier.org.au/iier19/ryan3.gif

Organizing nodes > themes

Organize your nodes

NVIVO

Organize your nodes

Build an efficient node hierarchy to clarify your thinking and reflect the association between themes

NVivo for Mac

Credit:
https://www.youtube.com/watch?v=KzLcFA0mWDQ

Organizing the viewing order of nodes

○ By hierarchy

    ○ Alphabetical

    ○ Add number before nodes to set your own node order

Viewing coding results

- Spread: line, paragraph

Auto-coding: mechanical coding

Format the transcriptions in Style

○ Heading 1: Parent (Main question)

○ Heading 2: Child (Sub-questions)

Steps:

Code > Auto Code > Paragraph style > Select Heading 1 / Heading 2 > new node > naming of new node > OK

https://www.youtube.com/watch?v=G279rrEnWOI
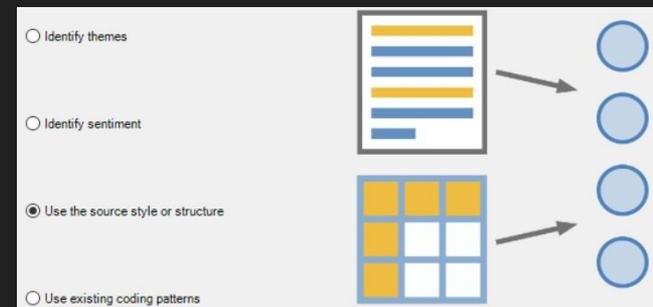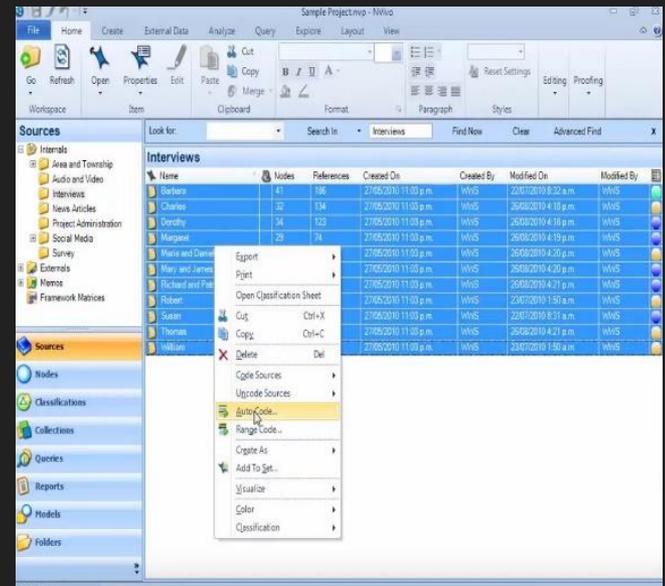
Text search & save as nodes

- Queries look for source *content*

- Text Search Query

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

- Saving the results as coding at nodes
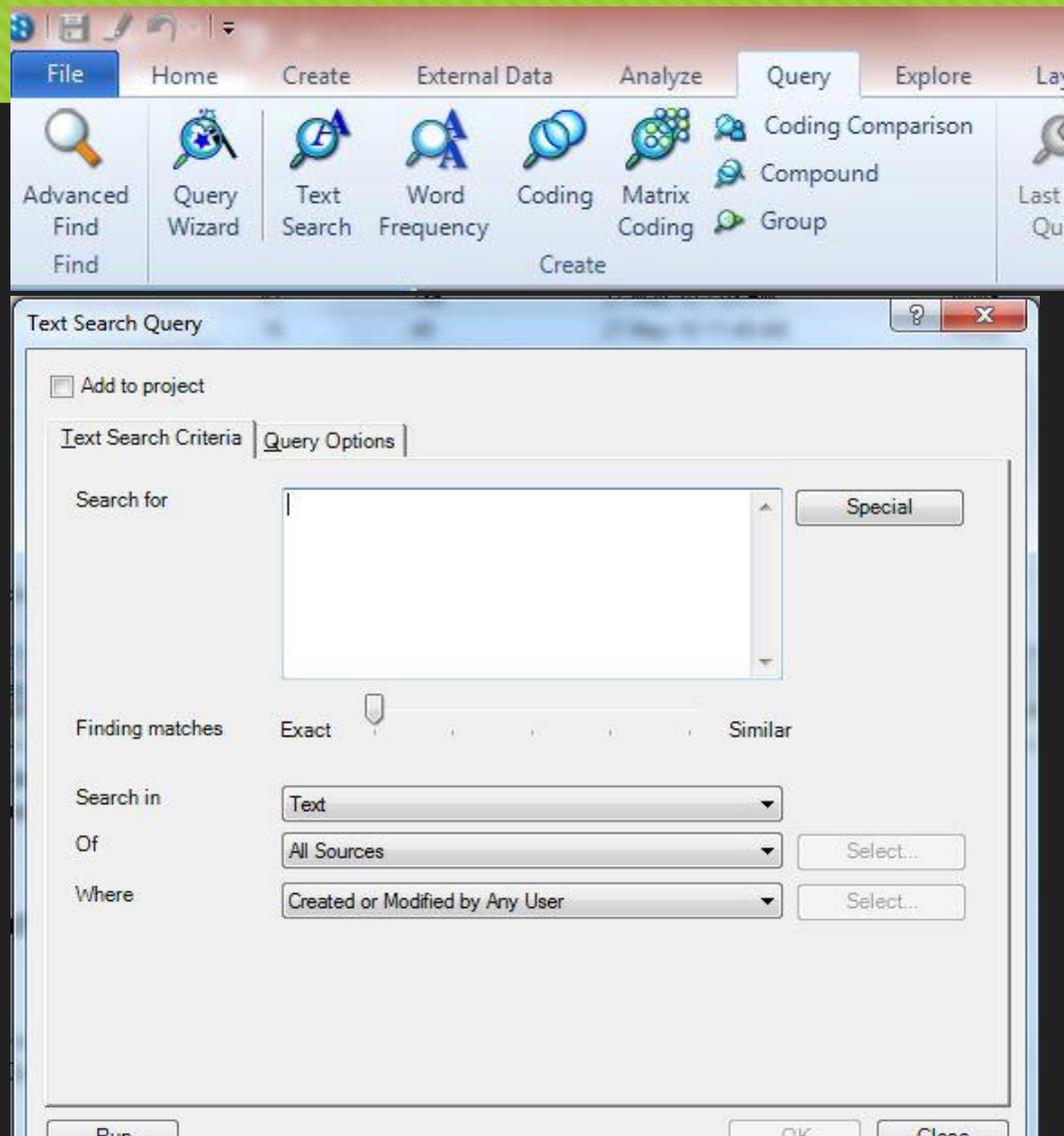
Making query after coding (1)

Search in 'Internal' source or 'Selected Items'

Making query after coding (2)

Select 'Any Selected Nodes'
&
Run Query

Source:
https://www.youtube.com/watch?v=NRSRIVBJD4I

Save results in 'Result folder' or as new node

Validation of qualitative research

- Multiple [independent] coding
- High intercoder reliability

  http://help-nv10.qsrinternational.com/desktop/procedures/run_a_coding_comparison_query.htm

- Respondent validation

Verification techniques used in qualitative research

Technique	Definition
Triangulation	Using multiple data sources in an investigation to produce understanding
Peer review/ debriefing	The "process of exposing oneself to a disinterested peer in a manner paralleling an analytical session and for the purpose of exploring aspects of the inquiry that might otherwise remain only implicit within the inquirer's mind"
External audits/ auditing	Auditing involves having a researcher not involved in the research process examine both the process and product of the research study. The purpose is to evaluate the accuracy and evaluate whether the findings, interpretations, and conclusions are supported by the data
Member checking	Data, analytic categories, interpretations, and conclusions are tested with members of those groups from whom the data were originally obtained. This can be done both formally and informally, as opportunities for member checks may arise during the normal course of observation and conversation

Image source: http://www.annfammed.org/content/6/4/331.full.pdf+html

Coding process (1)

Image source: https://www.youtube.com/watch?v=opp5tH4uD-w
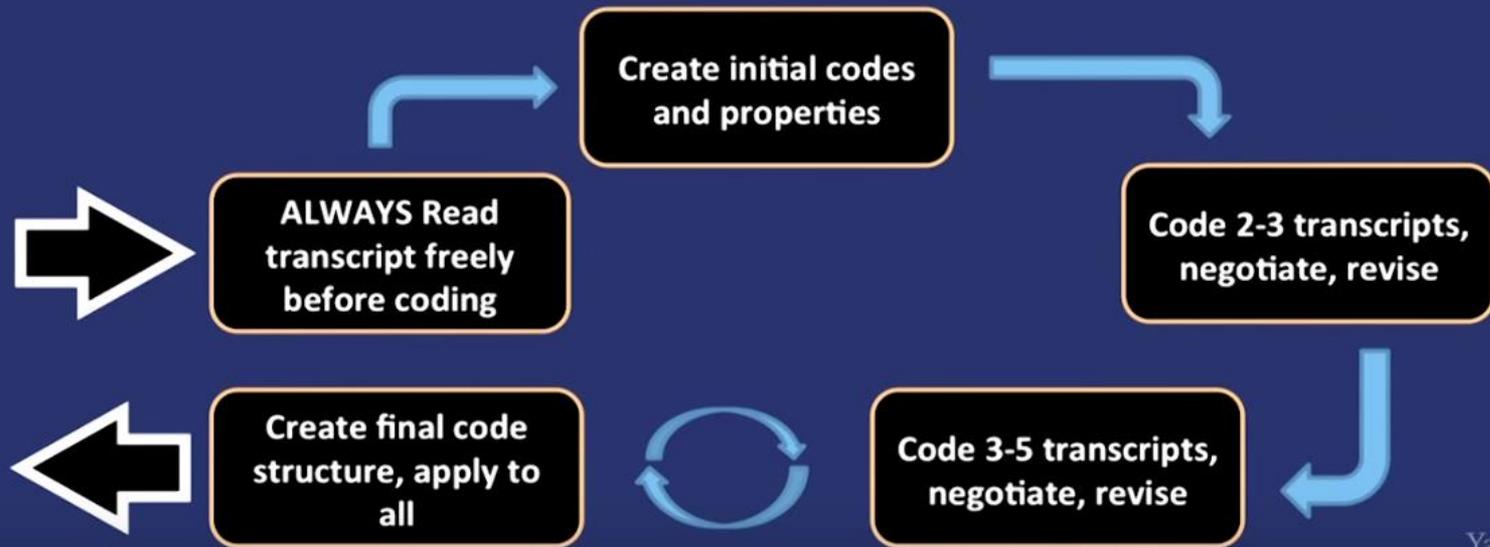
Coding process (2)

The Coding Process in Inductive Analysis

Initial reading of text data	Identify specific text segments related to objectives	Label the segments of text to create categories	Reduce overlap and redundancy among the categories	Create a model incorporating most important categories
Many pages of text	Many segments of text	30 to 40 categories	15 to 20 categories	3 to 8 categories
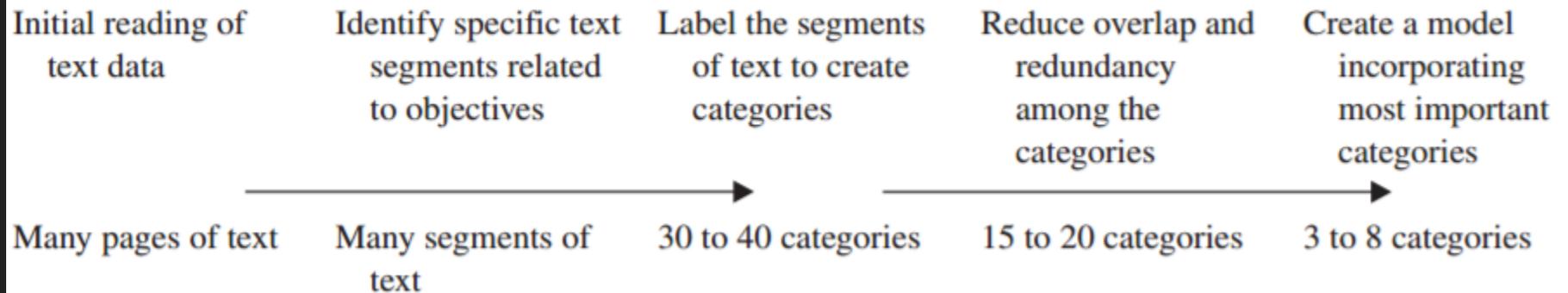
Image source: https://flexiblelearning.auckland.ac.nz/poplhlth701/8/files/general_inductive_approach.pdf

Model building

Image source:
http://www.tandfonline.com/doi/pdf/10.1080/13645570902996301?needAccess=true
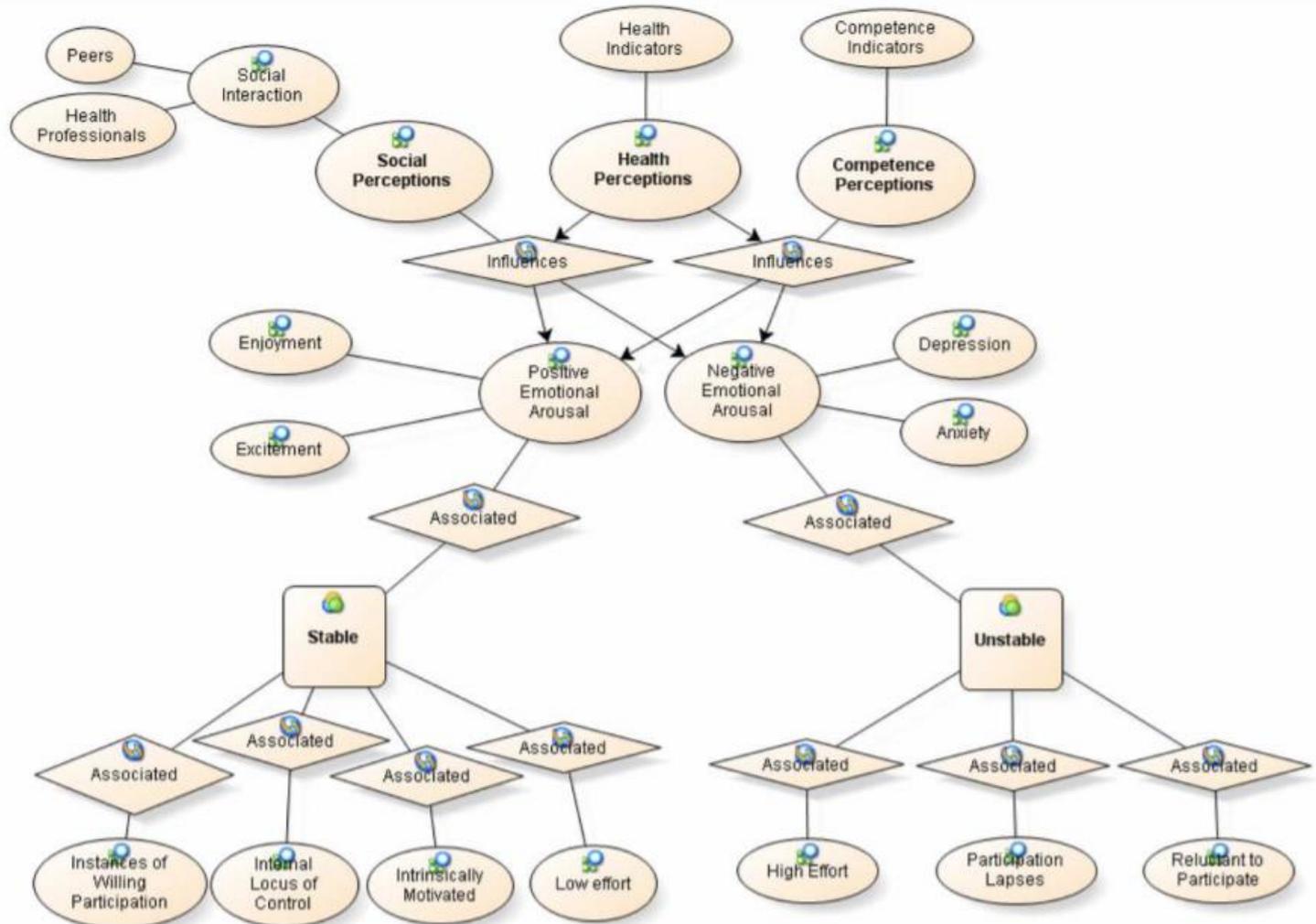
Research processes

- Research questions / foci

- Research methods, e.g. conducting interviews

- Data collection

  - Collect few interviews transcription

  - Collect all interviews > transcription

- **Data processing**

  - **Decide FULL transcription / summary of interviews**

  - **Listen to few recorded interviews**

  - **Decide what and how to code > categories / themes > sub-themes [common properties]**

  - **Validate coding > regularly comparing codes; comparing codes between coders**

BEFORE importing source materials

- Format: remove table in the Word file
- Data processing on interviewing script
  - Interviewees [pseudo name (unique ID), ID – discipline]
  - Entry by questions
  - Entry by main ideas
  - Entry by turns (interviewer / interviewee)
  - Transcription [relating to main research foci]
    - Spoken manner
    - Written form
  - Highlights in bold
- Create folders
- Import file as 'internal' source

Reflection

- Data sources?
- Coding wrt RQs
- Coding consistency
- Coding reliability
- Latent meaning (missing coding)
- Compare and contrast existing coding / examples
- Aggregation or expansion of themes/categories
- Supporting evidence [FGD, document (primary & secondary)

- Reaching **saturation**

    The final grounded theory should represent an explanatory model of the studied phenomenon grounded in relevant empirical data (Glaser & Strauss, 1967)

Conclusion

○ **RE'SEARCH'** > Providing evidence and supporting arguments through exhausting sources of data with renewal insights to formulate development of theories.

○ A systematic use of qualitative data analysis software can provide a reliable mechanism for conducting qualitative research.

Video tutorials (1)

- Importing documents in NVivo 10 for Windows in 3 minutes

  https://goo.gl/sbPDx5

- Importing datasets in NVivo 10 for Windows

  https://goo.gl/zPSKxK

- Getting started with NVivo

  https://www.youtube.com/watch?v=Xe0NpJPLQ6k&t=921s

Video tutorials (2)

o Creating nodes in NVivo 10 for Windows in 2 minutes

https://www.youtube.com/watch?v=idv9tILvgWc

o Coding is faster and easier in NVivo 11
https://www.youtube.com/watch?v=2ltGzs_uoog

o Coding a video in NVivo 10
https://www.youtube.com/watch?v=5MKf6DeJAb0

o NVivo 10 Text search Queries

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

o Automatic coding techniques in NVivo 11

https://www.youtube.com/watch?v=4S_xiW_vwWM

Video tutorials (3)

- *NVivo 11 Pro: Coding query

  https://www.youtube.com/watch?v=NRSRIVBJD4I

- *Using NVivo 10 for Windows for Sociological Qualitative Data

  https://www.youtube.com/watch?v=vfqaW61o0rg

More videos for Window Users

- Basic training NVivo 10

    https://www.youtube.com/watch?v=x0axXcOAGiU

- Autocoding

    https://www.youtube.com/watch?v=yKWj1HTOjR4

- Intermediate NVivo 11 training

    https://www.youtube.com/watch?v=XsploIE3Tvw

- Advanced NVivo 10 training

    https://www.youtube.com/watch?v=o9oiik67gNY

- Power of coding

    https://www.youtube.com/watch?v=sLX8vaK3qTw

Videos for Mac Users

○ Import Documents in NVivo for Mac | NVivo How-to Video (NVivo 10)

https://www.youtube.com/watch?v=lTGuYL5Xu4c&list=PLNjHMRgHS4Ffw7846yApe-qTP1kUrN4RX&index=2

○ How to import data from a spreadsheet in NVivo for Mac | NVivo How-to Video (NVivo 10)

https://www.youtube.com/watch?v=aSZC9mKu78Y&list=PLNjHMRgHS4Ffw7846yApe-qTP1kUrN4RX&index=14

○ How to annotate in NVivo for Mac | NVivo How-to Video (NVivo 10)

https://www.youtube.com/watch?v=YovxoK8Ahz4&index=13&list=PLNjHMRgHS4Ffw7846yApe-qTP1kUrN4RX

○ Organize your nodes (NVivo 11)

https://www.youtube.com/watch?v=KzLcFA0mWDQ

Videos for Mac Users

- Run a Text Search query with NVivo for Mac | NVivo How-to Video (NVivo 10)

  https://www.youtube.com/watch?v=816nFkivf3k&index=8&list=PLNjHMRgHS4Ffw7846yApe-qTP1kUrN4RX

- Getting Started in NVivo for Mac | NVivo Show and Tell Webinar (NVivo 10)

  https://youtu.be/w_S7S2_Rkog

- NVivo for Mac Overview (NVivo 11)

  https://www.youtube.com/watch?v=I-qvoGEZoW4=158s

More can be viewed at

https://www.youtube.com/playlist?list=PLNjHMRgHS4Ffw7846yApe-qTP1kUrN4RX (NVivo 10)

https://www.youtube.com/playlist?list=PLNjHMRgHS4FfTN-GoztTaPLshavAb0NxR (NVivo 11)

Manual links for Windows and Mac

○ NVivo 10 manual for Windows

http://download.qsrinternational.com/Document/NVivo10/NVivo10-Getting-Started-Guide.pdf

○ NVivo 10 manual for Mac

http://download.qsrinternational.com/Document/NVivo10forMac/NVivo10-for-Mac-Getting-Started-Guide.pdf

○ NVivo 11 manual for Windows, [Pro and Plus]

http://download.qsrinternational.com/Document/NVivo11/11.4.0/en-US/NVivo11-Getting-Started-Guide-Pro-edition.pdf [Pro]

http://download.qsrinternational.com/Document/NVivo11/11.4.0/en-US/NVivo11-Getting-Started-Guide-Plus-edition.pdf [Plus]

○ NVivo 11 manual for Mac

http://download.qsrinternational.com/Document/NVivo11forMac/11.4.0/en-US/NVivo-for-Mac-Getting-Started-Guide.pdf