

# Research Methodologies

*February 27, 2003*

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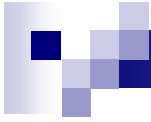
*With a little help from the Vancouver Canucks  
and John Creswell*





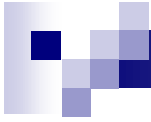
# Introduction

- ✍ I learned about Research Methodologies in the Faculty of Human and Social Development
- ✍ Enjoy the process of asking questions (at the end of a research project there are always more questions than before)
- ✍ My own research is about young people's experience with the Internet
- ✍ My experience with research is mainly within social science projects and Peggy's research group (CHISEL)



# Overview of Class

- ✍ Research? Why? What is it?
- ✍ Qualitative & Quantitative Research
- ✍ Example of an Ethnographic Study: InfoViz Student Culture.
- ✍ Small Groups: Relate to other InfoViz areas
- ✍ Other research methodologies
- ✍ Questions at the end & all the way through



# Why do research?

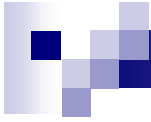
✍ What do you think about research?

✍ What research projects have you been involved in?

# What is research?

- ✍ Strategy of Inquiry or Systematic Investigation
- ✍ We do it every day.
- ✍ Example: Who are the Canucks playing tonight?





# Research is about knowledge

- ✍ How do you know what you know?
- ✍ Is knowledge something that is “out there”? That needs to be found? Or proven?
- ✍ Is it something that I understand in a dynamic interaction within a context?
- ✍ All of the above?



# Two Ways of Knowing (there are more)

## Postpositivism

- ✍ Determination
- ✍ Reductionism
- ✍ Empirical Observation and Measurement
- ✍ Theory Verification

## Constructivism

- ✍ Understanding
- ✍ Multiple Participant Meanings
- ✍ Social and historical construction
- ✍ Theory Generation

Creswell, 2003, p.6



# Quantitative Research - Definition

- ✍ A quantitative approach is one in which the investigator primarily uses post-positivist claims for developing knowledge (i.e. cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories).

Creswell, 2003, p.19

# Determine best goalie in NHL

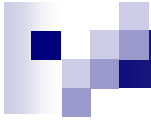


Cloutier named player of the week | 2.18.03



# Quantitative Research

- ✍ Experimental Designs
- ✍ Non-experimental designs such as surveys
- ✍ Predetermined instrument based questions
- ✍ Performance data, attitude data, observational data and census data
- ✍ Statistical analysis



# Qualitative - Definition

- ✍ A qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e. the multiple meanings of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/participatory perspectives (i.e. political, issue-oriented, collaborative or change oriented) or both.

Creswell, 2003, p.18



# Qualitative - Definition

✍ ... qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomenon in terms of the meanings people bring to them.

Denzin & Lincoln, 2000, p.3

# Understand Canucks' Interactions





# Qualitative Research

- ✍ Ethnography, Case Study, Grounded Theory, Discourse Analysis, Biography, etc.
- ✍ Emerging methods
- ✍ Open-ended question
- ✍ Interview data, focusgroup data, observational data, document data and audiovisual data
- ✍ Text and Image Analysis



# What methodology and methods do I choose?

✍ Depends on:

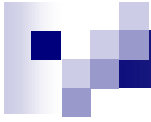
✍ Researcher Beliefs and Values

✍ Research Goals

✍ Researcher Questions

✍ Researcher Skills

✍ Time and Funds



# Research Process

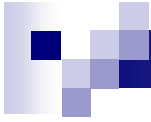
- ✍ What are the parts of a research project?
- ✍ What kind of research processes have you experienced?



# Dynamic Research Process

- ✍ Research Questions
- ✍ Research Goals
- ✍ Research Design
  - ✍ Methodology and Methods Choice
  - ✍ Data collection
  - ✍ Data analysis
  - ✍ Ensuring credibility
  - ✍ Data presentation

*Mostly an iterative process*



# Ethnography - Definition

- ✍ An ethnography is a description and interpretation of a cultural or social group or system.
- ✍ The research examines the group's observable and learned patterns of behaviour, customs, and ways of life.

Creswell, 1998, p.58

# Canucks Team Culture





## Example of an ethnographic study: InfoViz Student Culture

- ✍ Question: What are the cultural patterns that can be seen in computer science student groups when they learn about Information Visualization?
- ✍ Goal: Improve the quality of information visualization curriculum.



# Data Collection through ethnographic research methods

- ✍ **Field Work:** researcher/ethnographer spends time immersing him/herself in the field: takes part in computer science students lives at Uvic, e.g., participates in classes, socials, study sessions
  - ✍ **observes participants**
  - ✍ **takes field notes,**
  - ✍ **conducts interviews** (e.g. students, professors, dean, TA's, etc.)
  - ✍ **takes pictures**
  - ✍ **analyzes documents** (e.g., text books, teachers' slides, articles)







# Data Analysis

- ✍ Researcher **reads** through all the information collected (field notes, interview transcripts, video tapes...)
- ✍ **Makes meaning** of the data / **interprets** the data, looks for **key themes/patterns** that emerge from the data:
  - ✍ students never read extra article readings
  - ✍ students enjoy examples from company experiences
  - ✍ students work in groups



# Data Analysis

## From Themes to Interpretation

-  InfoViz students learn best when the material is presented is relevant to their career ambitions
-  InfoViz students are hands-on learners
-  InfoViz students are social
-  Other ways of interpretation?



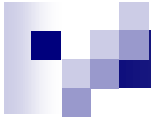
# Credible Research

- ✍ Are different in qualitative research than in quantitative research as the assumptions underlying the study are different
- ✍ Members of the cultural group resonate with the written research findings
- ✍ Clarifying researcher bias / location
- ✍ Leave a trail of how the researcher came to the conclusions she/he came to



# Presentation of Findings

- ✍ **Rich description of the context / situation – purely descriptive – locate yourself in the narrative**
- ✍ **Presentation of patterns found**
  - ✍ Use of quotes and examples from fieldnotes to illustrate points
  - ✍ Possibly tie into existing accounts of other cultural groups, other theories
  - ✍ Recommend ways to improve students' learning of infoviz, e.g., bring in guestspeakers from companies who produce infoviz software







# InfoViz Contexts

- ✍ How would ethnographic approaches or other forms of qualitative research work within other contexts of Information Visualization? Can you think of scenarios?
- ✍ What do you think are the benefits?
- ✍ What do you think are the drawbacks?







# Benefits and Drawbacks

## Pro's

-  Takes a more holistic, dynamic approach of understanding questions
-  People's perspectives are central to interpreting data
-  Open to emerging knowledge, not pre-determined
-  And more

## Con's

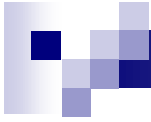
-  Not a quick process
-  Not generalizable – mainly limited to understanding a specific situation
-  No numbers (unless mixed methods are used)
-  And more



# HCI Context


✍ CHARM Choosing Human-Computer Interaction (HCI) Appropriate Research Methods lists the reasons why ethnography is important for HCI and its drawbacks:

- ✍ Powerful assessment of users' needs
- ✍ Uncovers the true nature of the system users' job
- ✍ Open-ended and unbiased nature of ethnography allows for discovery
- ✍ Time requirements long
- ✍ Presentation of results not easy to fit designers needs
- ✍ Scale (usually a small number of participants)



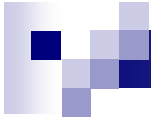
# More Qualitative Methodologies

- ✍ Grounded Theory (generate a theory)
- ✍ Case Study (describe a case)
- ✍ Biography (person's life story)
- ✍ Phenomenology (essence of a phenomenon)
- ✍ Discourse Analysis (critical document analysis)



# General Characteristics of Qualitative Methodologies

1. Take place in the natural setting
2. Use multiple methods that are interpretive
3. Are emergent rather than tightly prefigured
4. Are fundamentally interpretive (role of researcher as interpreter)
5. Researcher views social phenomena holistically
6. Researcher location is reflected upon



# Grounded Theory - Definition

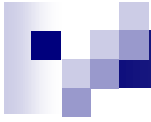
- ✍ The intent of a grounded theory study is to generate or discover a theory, an abstract analytical schema of a phenomenon, that relates to a particular situation. Creswell, 1998, p.56



# Grounded Theory - Example

✍ Example Co-op Student: Tried to develop a theory about how users theoretical models of software engineering are related to use of SHriMP

- ✍ use and analysis of user studies
- ✍ use of other theories
- ✍ purposeful sampling



# Case Study - Definition

✍ ... a case study is an exploration of a “bounded system” or a case over time through detailed, in-depth data collection involving multiple sources of information rich in context.

✍ Creswell, 1998, p.61



# Case Study - Example

- ✍ MA Student examining her experiences as a co-op student with a non-profit agency in deploying software in Africa.
- ✍ Use of interviews
- ✍ Use of Field notes
- ✍ Use of existing literature on software issues in developing countries



# Summing up...

- ✍ Qualitative methodologies can give insights into complex, interactional processes
- ✍ Qualitative Methodologies vary in their goals (describing a culture, describing a case, creating a theory) but their research methods are often similar
- ✍ Mix and Match is increasingly popular

# Last thoughts...

- ✍ **Research findings depend on the research questions asked, the researcher and research methods used**
- ✍ **Different research methodologies are useful for different questions and usually complement each other to illuminate different aspects of the whole picture**





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