

Science and Scientific Research

RSM 321 (Lecture 1)

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Lecture Outline

- ❖ What is science?
- ❖ Scientific concepts and method
- ❖ Forming of groups of 4 students



What is special about scientific research?

- ❖ Research is one of several ways to find answers to your questions

Example of a question:

- ❖ What are the characteristics of the weather in Bangladesh?

- ❖ What is the opinion of international students about the weather in Bangladesh?



What is special about scientific research?

❖ What differentiates scientific research from everyday observation?

Both are empirical, however science is in addition:

❖ Theoretical

❖ Cumulative

❖ Systematic: uses procedures, methods and techniques that have been tested for their validity and reliability

❖ Process is documented

❖ Rigorous, concentrated

❖ Unbiased

❖ Non-normative } objective



Scientific concepts

- ❖ framework of a set of theories (paradigm)
 - For example: the 'way of thinking' in the specific academic discipline in which you are trained
- ❖ Validity
 - Do I really measure what I want to measure?
- ❖ reliability
 - Do I get the same results on second occasion?
- ❖ unbiased
 - No distortion or misrepresentation of results
- ❖ objective
 - Detached from the person of the researcher



Distinctions in scientific research

❖ Which distinctions in science do you know?



Distinctions in scientific research

- ❖ From the perspective of application
 - Pure / fundamental / theory oriented
 - Applied / practice oriented
- ❖ From the perspective of hypotheses
 - Descriptive (proto-science)
 - Exploratory / theory generating
 - Confirmatory / theory testing
- ❖ From the perspective of inquiry mode
 - Quantitative
 - Qualitative
 - Mixed



Quantitative and qualitative research

Quantitative approach:

- ❖ using standardized instruments
- ❖ focus on counting and measuring numbers / quantities of a situation / phenomenon
- ❖ looking for regularities

Qualitative approach:

- ❖ the researcher is the instrument
- ❖ focus on understanding a situation / phenomenon from an insider's point of view
- ❖ looking for specifics



Distinctions in scientific research

❖ From the perspective of source

- Primary data (researcher's own measurements)
- Secondary data (others' measurements)

❖ From the perspective of observations

- Empirical research / non-empirical research

❖ From the perspective of type of discipline:

- Beta research / gamma research



Importance of beta-gamma relation at WUR

- ❖ Beta:
 - natural and technical sciences
- ❖ Alpha:
 - arts, humanities (language, history, law)
- ❖ Gamma:
 - social sciences



Importance of beta-gamma relation at WUR

Science: okay. But why study social science??

Failure of technocratic approach: technological innovations and/or solutions do not always fit in the socio-cultural reality (and vice versa)



Vacuum-toilet



Separation of feces
and urine at the source



Fuel wood



- Harare, capital of Zimbabwe
- At least 50% of the households with a connection to electricity still use fuel wood for cooking.



Cattle



On the other hand: social ideas or solutions do not always fit in the technical reality!

Example:

- Animal friendly transport of farm animals?

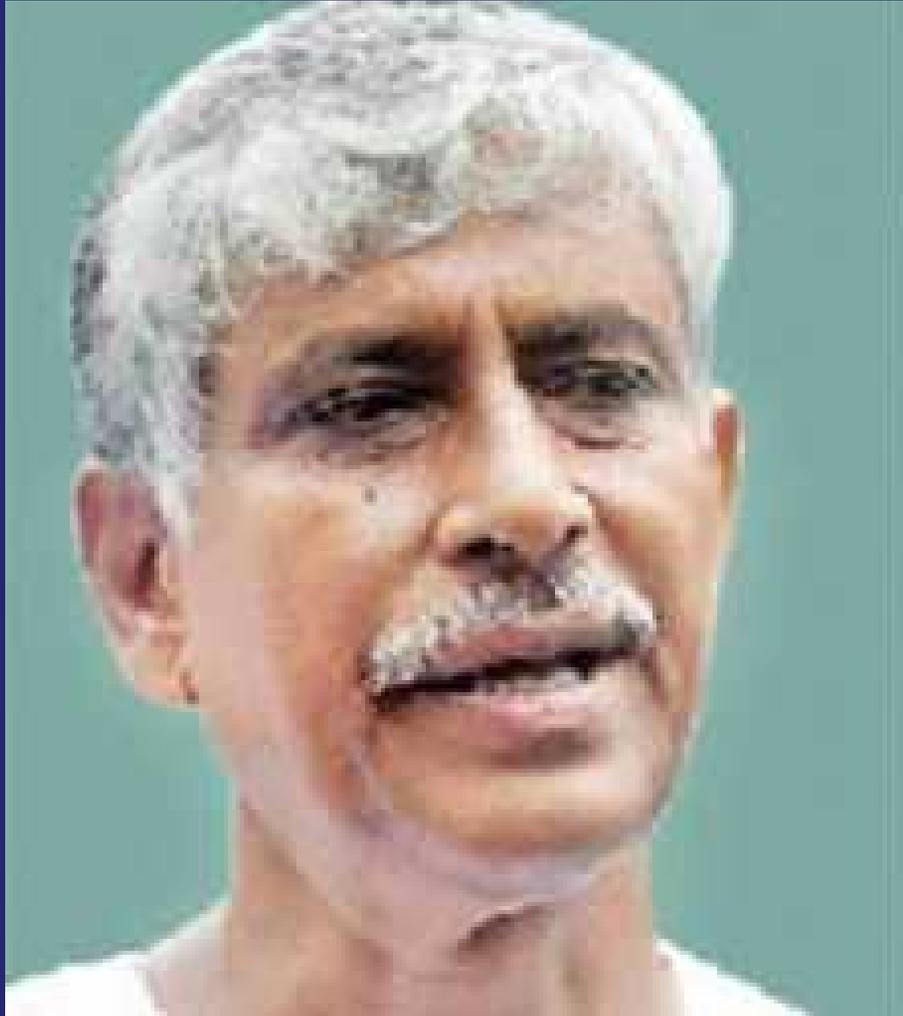


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Thank YOU



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Questions??