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PRØVE

RIS660 1 Research Methods in Risk, Safety, and Security Studies

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1 Question 1

Realisme og sosialkonstruktivisme blir ofte satt i kontrast til hverandre som tilnærminger til forskning. Bruk begrepene risiko, sikkerhet og sikring (security) for å forklare forskjellen mellom disse to perspektivene. (10%)

Skriv ditt svar her

T. Aven defines *risk* as the uncertainties related to the consequences or outcome of an activity with respect to something that humans value. We make a distinction between safety and security, in which *safety* relates to unintended actions, such as accidents caused by human or technology. *Security* relates to intended actions done by malicious actors, such as hacking and terror attacks. Research concerning risk, safety and security considers the methods, approaches and models used to describe and generate knowledge, defined as justified beliefs, on risk, safety and security. This is important, as the qualitative paradigm has usually been associated with the social constructivism of risk, while the quantitative has usually been associated with the realist approach to risk. The difference between these the realist and social constructivist approach to research, can in many ways be illustrated by how they approach risk, safety and security.

Realism is the traditional view of risk, safety and security. In this perspective, risk is defined in an objective way, and risk is something that exists 'out there'. Realists usually define risk as the probabilities x consequences, taking uncertainties into account as well. In the light of the realist view, it is in principle possible to achieve full knowledge of the world - it just depends on the degree to which the concepts are well developed enough. The task of research is to develop theories about the world, and test hypothesis against these theories. Research should be value free and there is an important distinction between facts and values.

Social constructivism focuses on that the knowledge generated, is constructed by the research community. It will be affected by social, political and cultural factors. Social constructivism indicates that how we define risk, is influenced by these aspects. Therefore, some risk, safety and security researchers belonging to the social constructivist approach, see risk as the same as risk perception. It is the society, through its culture, politics and social norms who construct what is to be considered risk, and what is to be defined as threats to safety and security. Subjectivism is therefore important in this regard. In order to develop research of risk and include measures to ensure safety and security, one must have these subjective manners in mind. The social constructivist approach has criticized the realist approach, pointing to the fact that theory cannot be 1:1 with the real world.

Although these are seen as contrasting views of research, it is important to consider their relevance to each other, for example illustrated through the IRGC Framework.

Ord: 420

2 Question 2

Risiko, sikkerhet og sikring (security) er brede og mangesidige temaer som forskes på av ulike vitenskapelige disipliner og fra ulike perspektiver. The Society for Risk Analysis (SRA) foreslår at kunnskapsgenereringen om disse temaene kan deles inn i en A- og en B-kategori. Forklar og gi eksempler på disse to kategoriene av kunnskap og hvordan de forholder seg til hverandre. (10%)

Skriv ditt svar her

There is a distinction between applied risk analysis (category A) and generic risk analysis (category B). In applied risk analysis, risk science is the supporting science. It considers using methods, approaches, models and conepts to be applied on risk analysis of specific activities. It considers knowledge about the "real world". Examples of applied risk analysis include the design and construction of a bridge, and a national security assessment.

In generic risk analysis (category B), risk science is the core science. It considers applying methods, models, approaches and concepts to risk communicaton, risk management and risk governance. There is a normative dimension related to the generic risk analysis, in which we seek the "best" concepts. What are really these best concepts? Examples of generic risk analysis is how to deal with complex uncertainties in risk analyses, and how to properly define and operationalize "emergent risks".

There is an important linkage between these two forms of risk analysis, and they are mutually dependent in that generic risk analysis can produce applied risk analysis, and applied risk analysis can produce generic risk analysis. This is highlighted by The Society for Risk Analysis (SRA), and is discussed by T.Aven. They are also both important in relation to conceptual research.

Activities considering applied risk analysis can benefit from generic risk analysis. For example, you want to investigate how safe school teachers feel at work. You may then apply models considering safety into this research, generating knowledge about safety for school teachers. Another example is conducting a focus group with experts discussing a new safety model. Here, it is also possible to apply models considering safety models to generate new knowledge of how the safety model can be applied in specific ideas.

Applied risk analysis can also generate generic risk analysis. Although this route is not as common as the other, it is still highly relevant and important for knowledge generation. For example, say you are writing an article about emerging technology risks, and during the research process, realize that ther is no consensus of the term "emergent risks". This will trigger efforts of knowledge generation for generic risk analysis to better the understanding of this term. The example considering the focus group with experts is also relevant in this case. That is because the focus group may produce theory relevant for generic risk analysis in itself. This example then illustrates the importance of the mutually independence between generic and applied risk knowledge.

Ord: 407

3 Question 3

Forskningsdesign kan betraktes som den overordnede strategien for å besvare forskningsspørsmål. En konseptuell modell for å tenke på forskningsdesign i en samfunnsvitenskapelig kontekst er presentert i pensum og består av fem hovedelementer. List de fem elementene i forskningsdesign i henhold til denne modellen og gi en kort beskrivelse av hvert element. (10%)

Skriv ditt svar her

There are many different conceptual models thinking of research design. The following model is proposed by Robson et al.

1.*Purpose(s):* what is the aim of the study and what is it trying to achieve?
2.*Conceptual framework:* What will the theoretical framework be? What are the factors and how are they related?
3.*Research questions:* What do you need to know in order to achieve the purpose(s) of the study?
4.*Methods:* What specific techniques (e.g. semi-structured interview) are you going to conduct in order to achieve the purpose(s) of the study? How will you show that the collection of data is reliable?
5.*Sampling strategy:* Who will you seek information from? When and where? How will you balance the need to be selective and the need to gather the data required?

In this model, the purpose(s) and conceptual framework will feed into the research questions. Once these are known, the methods and sampling strategy can be developed.

The model is central for both fixed and flexible designs. A central difference of their application, is that in fixed research designs, the application of these are more rigorous, for example in that once the research questions are set, they cannot be changed throughout the process, as with flexible designs.

These are all related, and it should not exist mismatches between the different elements. An example of such mismatches is that the only research questions you can think of, does not answer to the purpose(s) of the study. Another example is that the chosen method will not help in answering the research question.

Even though ethical consideration is not a part of the listed elements, Robson et al. states that this is an important element as well that should be considered in all phases of thinking of the research design. This highlights the statement that ethical consideration is not a stand-alone activity, but one that should be considered during the whole research process. That is because ethical considerations is of such importance in all the elements. For example, when choosing who you will seek information from in the sampling strategy, one should always consider the importance of voluntary participation.

Ord: 353

4 Question 4

Både fleksible og faste forskningsdesign har blitt diskutert i dette kurset.

a) Forklar forskjellen mellom disse to typene forskningsdesign. (6%)

b) Hvilket av disse to designene vil du anbefale i en situasjon preget av begrenset teoretisk kunnskap og hvor klare forskningsspørsmål er vanskelige å formulere? Hvorfor? (4%)

Skriv ditt svar her

a) There are important differences between fixed and flexible designs. These are two opposites, and Robson & McCartan highlights how these are not the only ways of considering research designs, as one can also for example consider a combination of both, through the pragmatic approach.

Fixed designs are usually done within the quantitative paradigm, and is constructed within the characteristics of this. Some of these characteristics is the focus on numbers and statistics, a focus on behavior, and a distance between the researcher and the participants to ensure objectivity. The framework from question 3 can illustrate the rigorous approach taken when employing a fixed research design. The research question cannot be changed once the process has begun. There must be a clear sampling strategy and conceptual framework. One must know the methods to use and what kinds of data they will yield. It is further important to know how the data should be analyzed. Fixed designs will also usually consider general patterns instead of complexities and nuances on the individual level. For fixed designs, it is also considered important that the analysis is detailed described, so that other researchers later will be able to replicate the study.

Flexible designs are usually done within the qualitative paradigm. Therefore, the design will usually follow the characteristics of qualitative research, for example that it presents data in verbal and other non-numerical form and that values of both the researcher and the participant are welcomed. In flexible designs, the elements of purpose(s), conceptual framework, research questions, methods and sampling strategy is also of important relevance, but in a different way than the fixed designs. For example, it will be possible to change the research question(s) after the research process has begun. Different approaches can be employed. It is recommended that the researcher begins with one approach, before elements from other approaches can be employed in a later stage of the study. Flexible research designs are more focused on complexities and nuances on the individual level, as opposed to fixed research designs.

b) Both of the research designs can be employed in a situation characterized by limited theoretical knowledge and difficulties in formulating research questions. It will depend on the situation, and what one chooses to focus on.

It can be argued that a flexible design is more appropriate in this situation. That is because, as mentioned in question 4a, the research questions may change in relation to the development of the research process. This can be positive in a situation where it is hard to develop a research question, as one can adapt to the situation, when for example getting more knowledge. Although a flexible approach can be valued in this manner, it must also be considered that research within this area to a degree is dependent on theoretical knowledge, as abstract concepts are more relevant in this approach. That may make a flexible design hard to employ in a situation characterized by limited theoretical knowledge.

Grounded theory is an approach to flexible design, and is relevant in situations with limited theoretical knowledge and difficulties formulating research questions. That is because the theory will be developed based on the situation in which the research takes place, and is thereby 'grounded' in the data. This is an approach initially developed by Glaser and Strauss as a reaction to the sociological stance that there always must be a firm theoretical background to research. Some disadvantages to reflect over however, is that it is very hard to develop research without any theoretical assumptions whatsoever. Also, it is hard deciding when a theory is developed 'enough'.

It can be argued that the fixed research design will not be appropriate for this type of situation. As mentioned in question 4a, a common characteristic of the fixed design, is that the research question must be well developed before starting the research project. This is hard to achieve in a situation where there is hard to develop a research question.

Ord: 659

5 Question 5

Case-studier ble fremhevet som en sentral tradisjon innen fleksible forskningsdesign.

a) I konteksten av sikkerhetsforskningsstrategier skiller forfatterne Antonsen og Haavik mellom induktive og deduktive case-studier. Hva menes med induktive og deduktive case-studier? (6%)

b) Hendelsesrapportering og oppfølging studeres i en case-studie som involverer fire caser (organisasjoner). Kan funnene i denne studien brukes til å gjøre statistiske slutninger om en større populasjon av organisasjoner? Hvorfor/hvorfor ikke? (4%)

Skriv ditt svar her

a) Case studies is a tradition to flexible research design, in which one studies a specific case, for example an individual person or an organization.

Antonsen & Haavik distinguishes between inductive and deductive case studies. The deductive type is further categorized into deductive case studies with the least likely case, and deductive case studies of the most likely case. The inductive case studies are case studies using theoretical perspectives when conducting the case study, with the aim of providing more knowledge to an immature part of research. The deductive case studies of the least likely case, investigates a case in which it is least likely that a theory has explanatory power. It is important as this also has an illuminating effect on immature research areas. The deductive case studies of the most likely case, investigates a case in which it is most likely that a theory are employed and will have explanatory power. If it is then shown that there is lack in the theory, then there is strong evidence that the theory should be subject to revising.

b) Sometimes, multiple case studies can be effective and necessary, depending on the situation, and depending on the particular case we are trying to study. When we talk about making statistical inferences about a larger population, the concept of generalizing is of relevance. This is also referred to as external validity, and considers how the results of the study can be generalized to a larger population. One the one hand, there are some general difficulties with applying this issue on case studies and other approaches in the qualitative paradigm in general. When it comes to the case study of these four organization, one has to consider the possibility that the four organizations may have characteristics in common that makes generalizing to a wider population harder. For qualitative studies, analytical generalizations may be more applicable, in which theory and research may work instead in explaining the results of the case study. The findings can on the other hand be used for making statistical inferences about the larger population of organization, but it will depend on how well the ways of ensuring generalizations and making statistical inferences are done. It is important to consider whether or not it is a representative sample.

Ord: 378

6 Question 6

Etnografi refererer tradisjonelt til studiet av grupper av mennesker i deres daglige liv, ideelt sett over en lengre periode av en eller flere forskere som i ulik grad er i feltet.

a) Forfatteren C. Kuran brukte denne typen tilnærming for å studere regelbøying i tungtransportsektoren (HGV-sektoren). Hva var to styrker med å bruke etnografisk metodologi i denne settingen? (6%)

b) Observasjonsbias og reaktivitet kan være utfordringer i etnografiske studier. Forklar hva som menes med disse begrepene. (4%)

Skriv ditt svar her

a) An ethnographic study investigates a social group in order to learn about them, surrounding the cultural and social environment. The aim is to provide an insiders perspective of culture, social norms, non-verbal language and communication within the relevant group.

One strength in this study was that he was able to get a look into the risk perceptions in the studied group. Another strength was that he could understand their practices and actions from their point of view. These strengths are related to the overall benefits of applying an ethnographic methodology. Even though critics have claimed that reactivity might ruin the purpose of the study, the proponents have argued that one *has* to disturb the relevant situation in order to get an insiders perspective, and see things from their point-of-view. The strengths described by C.Kuran also relates to the benefit of getting a more correct view of the culture of the relevant group that there might be limited knowledge about, or that there are wrongly assumptions about.

b) Reactivity considers the extent to which an observer might change the environment they are in, ruining the purpose of the study. How do we know what the situation would be like if the ethnographic studies did not take place? When it comes to reactivity, it is relevant to reflect over the possibility that the studied population might change their behavior because of the research taking place. The difference between a loose and strict form of observation might highlight the difference. The strict form follows the principles of the quantitative paradigm in that the researcher must be limited to having a pure observational role in order to not change the environment. In the more qualitative form, however, the researcher takes a role in the cultural group, becoming a part of the social and 'symbolic' world of the participants, learning their culture, language and non-verbal communication. One can reflect over which approach might lead to more reactivity; will the researcher change the environment less by being a complete observer, or if they become a part of the group themselves?

To explain what biases are, one might use the four types of biases in ethnographic studies proposed in the curriculum. The first one considers how our expectations, background and experience affect how we see the situation. Also, factors of the situation itself might form this sort of bias, as maybe some participants are more prominent than others. The second form of bias is selective encoding. This means that these expectations, experiences and background may also affect how we encode the situation. The suggestion is to have an open mind, and keeping it open through the process. The third form of bias is selective memory. The longer you go before you write down what you have observed, the more inaccurate will the description be. The fourth type of bias is interpersonal factors. When starting the ethnographic studies, one might get to know one or two of the participants more than the rest, maybe because they are the most welcoming. One must here reflect over the fact that they might be welcoming because they do not get along with the other participants.

Ord: 525

7 Question 7

Intervjuer og fokusgrupper er vanlige metoder for å samle inn data i forskning på risiko, sikkerhet og sikring.

a) Intervjuer kan ha ulik grad av struktur og standardisering. Beskriv kort de tre typene intervjuer i denne sammenhengen. (6%)

b) Atferden til intervjueren har stor innflytelse på villigheten til de intervjuede til å snakke fritt og åpent. Hva var to hovedråd for intervjuere i denne sammenhengen? (4%)

Skriv ditt svar her

a) Interview is a form of research method in which the interviewer asks question related to their research, hopefully receiving answers from the participant(s). Focus groups are group interviews, focusing on a specific topic. Both interviews and focus groups can be structured, semi-structured and unstructured.

In structured interviews, the interviewer has predetermined questions, which are in a set wording and a set order. In semi-structured interviews, the interviewer has an interview guide working as an overview over questions to ask. However, the questions might undergo some change in relation to the interview flow. Additional questions can also be asked, depending on the answers from the interviewee. In unstructured interviews, the interviewer has an idea of a concept to be investigated, and will conduct a conversation within this theme. It can be completely informal. Loftland (2006) do recommend to have some form of guide for what will be considered in interviews. Semi-structured and unstructured interviews are the most common form used in flexible designs.

b) In the curriculum, different advices for interviewers are proposed. This is of importance as it will influence the aim of getting the interviewees to talk open and freely, which again rears questions of validity. One of the advices is to ask questions in a clear and unthreatening manner. If interviewees are either confused or scared, you will not receive the information you need. Another advice is to enjoy the experience (or at least look like you do). There is a great chance that the interviewees will answer the questions in a more free and open manner if the interviewer looks interested in the answers of the interviewee. If the interviewer for example looks scared or bored, it can affect the answers from the interviewee; maybe they will shorten the answers in order to be done quickly, or they will answer what they think the interviewer wants to hear, if the interviewer looks dissatisfied with the answers provided. This will lead to a problem of bias.

Ord: 329

8 Question 8

Spørreundersøkelser er mye brukt i studier av risiko, sikkerhet og sikring, og ble i dette kurset betraktet som en type ikke-eksperimentelt fast forskningsdesign.

a) Forklar hvorfor spørreundersøkelser betraktes som ikke-eksperimentelle (i motsetning til eksperimentelle). (3%)

b) Hvordan kan en lav svarprosent utfordre validiteten til en utvalgsundersøkelse? (3%)

c) Si at du vil måle i hvilken grad dine undersøkelsesdeltakere opplever arbeidspress. Hva ville være to grunner til å bruke et eksisterende sett med spørsmål for å måle dette konstruktet (i motsetning til å lage ditt eget sett med spørsmål)? (4%)

Skriv ditt svar her

a) Surveys typically belongs to the quantitative paradigm of research. Most surveys are sample surveys.

Both experimental and non-experimental research designs are fixed, but there is an important difference between experimental and non-experimental research designs. Experimental research designs considers allocating the participants, and the manipulation of one or more variables (independent), and also the measure of this manipulation of variables (dependent). The non-experimental research designs does not include this form of manipulation of the situation.

Surveys are typically non-experimental fixed designs. It is important that they are fixed because once the survey is sent out, it will not be possible to change it. That is why for example the research question must be clearly defined and you know what sampling strategy to employ. Surveys are non-experimental in that it does not include the manipulation of the situation. It is important that surveys are done in this manner, and that is what makes more sense, considering the characteristics of surveys.

b) When considering validity, we ask the question; are our conclusions justified? Are we actually measuring what we think we are measuring (construct validity)? And can our methods justify our conclusions (internal validity)? The external validity (generalization) considers if the results can be generalized to the wider population from which the sample is taken from. Most surveys are sample surveys, in which a sample of the wider population is relevant.

A low response rate can represent a challenge to the validity of a sample survey, and it is one of the downsides of surveys described by Robson et al. If the response rate is low, we might not get the range of answers we need in order to secure the construct validity. For example, consider you want to send out a survey regarding risks among car drivers among the Norwegian people. What if the few people that have answered, all have in common that they do not care about these risks? Or they all have in common that they are 50+ year old men, when the aim is to investigate the whole Norwegian population? This will not provide the information needed in order to justify the conclusions, and to generalize the findings beyond the sample.

c) There are many reasons for using an existing set of questions to measure this construct as opposed to making your own questions. One reason is that it may already be reviewed by researchers. One also has to consider a negative effect of doing this; you might have to make changes because the questions might not fit exactly with what you are trying to achieve. If the

set of questions then have been reviewed by other researchers, it might not count anymore if you have made changes.

Another reason for using an existing set of questions can be that it is time-effective. Making a set of questions is a timely manner, and using an existing set of questions will maybe take less time. Again is it important to reflect over this element, as there are situations in which it may even take longer time, for example finding out in a later stage that the set of questions does not really fit in with the topic of how the respondents experience work pressure.

Ord: 536

9 Question 9

Som en del av dette kurset ble du bedt om å utføre en tematisk kodingsanalyse. Beskriv de fem fasene av å utføre en tematisk kodingsanalyse slik de ble presentert i pensum. (10%)

Skriv ditt svar her

Thematic coding analysis is categorized as a way of analyzing qualitative data. But it considers a wide range range of data which can be analyzed. The following five stages are presented in the curriculum as the stages of doing thematic coding analysis.

1. *Familiarize yourself with the data:* This includes transcribing the data, reading and re-reading the data, and noting down initial thoughts.
2. *Generating initial codes:* One could do this by constructing a framework or template, or inductively by analyzing the data. Extractions of the data are coded in a systematic fashion over the entire data set.
3. *Identifying themes:* This includes collating codes into themes, and analyzing the information of each theme over the entire data set. One also analyze whether the themes go well with the codes. Also, one must revise the themes and/or codes if necessary.
4. *Constructing a thematic network:* This includes constructing a 'map' over the analysis.
5. *Interpretation and investigating:* This includes investigating parts of the analysis using for example tables. One will interpret the patterns produced by the analysis, and also demonstrate the quality of the analysis.

Ord: 185

10 Question 10

En spørreundersøkelse gjennomføres med følgende utsagn: "Jeg vet hvordan jeg utfører grunnleggende førstehjelp." Deltakerne kan deretter svare med skalaen 1 = helt uenig til 5 = helt enig.

a) Nivå (sentral tendens) og spredning (variabilitet) er aspekter av den resulterende datadistribusjonen. Gi et eksempel på et mål for hvert av disse aspektene. (4%)

b) Hva vil en frekvenstabell av dataene vise? (2%)

c) En t-test gjennomføres for å sammenligne svarene gitt av personer med og uten førerkort. Testen gir en p-verdi på 0,01. Hva uttrykker denne verdien? (4%)

Skriv ditt svar her

a) Measures of central tendency includes the mean, median and mode. The mean is the average, which you achieve from adding all scores and dividing by the number of scores. Central tendency is expressed through for example variance, which is the average between the highest and the lowest score.

b) A frequency table is central in showing the distribution of frequencies of variables. In this case, it would show the distribution of answers among the different categories.

c) The p-value expresses whether the differences you observe is due to true difference or by chance variation alone. This assumption of 'no difference' is referred to as the null hypothesis. The p-value is a measure of the degree to which the null hypothesis is true. A lower p-value indicates that the difference observed is due to true difference rather than chance variation, all other things considered. The p-value of 0.01 is relatively low, and therefore indicates that the null hypothesis can be thrown, showing that there may be a difference between the people with a driving license and without a driving license.

Ord: 180