

**The digital learning resource S-vev.no in citizenship education
– Pedagogical design and actual use**

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Executive summary

This thesis concerns the digital learning resource *S-vev*, used in citizenship education in Norwegian colleges. The Norwegian Social Science Data Services (NSD) has produced *S-vev* to be a supplement, or an alternative to the traditional textbook. The web site contains texts and social science data, including a tool for statistical analysis.

S-vev is one of the outcomes of a government initiative for providing digital learning resources in citizenship. The National Board of Education administered the initiative and demanded that the digital learning resources should bear on creative pedagogical solutions. The initiative is important, since research within the field of ICT in citizenship suggests that time is ripe for creative pedagogical solutions. Previous applications of ICT in citizenship have been relegated to being an appendage to traditional educational material: the focus has been on providing students with citizenship *content* (Whitworth & Berson, 2003). Literature on ICT and citizenship, on the other hand, suggests that simply providing students with content is suitable for creating passive citizens (Selwyn, 2002). The Norwegian curriculum for citizenship states a clear aim of creating active citizens. In doing so, the literature encourages the combination of both *content-led* and *processes-led* approaches (ibid.). ICT is promising for supporting such a combination. It can access the world's largest base of content (the worldwide web) and can provide flexible tools supporting a variety of processes.

The theoretical recommendation to combine both content and processes is reflected in the pedagogy NSD has stated for *S-vev*. The producer's goal with *S-vev* is to enable students to participate in a process where knowledge is created through the gathering and analysis of relevant information.

S-vev is built on NSD's pedagogical platform 'the laboratory of social science'. The concept of laboratory is known from science education, where students are exposed to the raw material of the subject, and are equipped with tools to perform experiments. NSD wants to bring the idea of the laboratory into citizenship education by providing students with statistical material, and a tool for exploring the material. *S-vev* follows up this. It contains statistical data, mainly containing results from surveys. To enable analysis of the data, the web site is equipped with a statistical engine, NSDstat for Web.

According to NSD, the laboratory of social science gives students the opportunity to engage in an 'exploratory process' where they tabulate statistical variables of their choice to shed light on a problem area. The goal of the exploratory process is that they start reflecting on underlying causes of how the variables are related, and the implications of their findings. *S-vev* contains 160 assignments designed to assist students in exploring data. The assignments, called 'Explore Data', are *S-vev*'s main pedagogical resource to realise the laboratory of social science.

Since the National Board of Education demanded ‘creative pedagogical solutions’, this study pursues S-vev pedagogy in two phases. First, in the pedagogical design of the Explore Data assignments and secondly, in students’ work with the assignments. The study is positioned within the research field of CSCL (Computer-Supported Collaborative Learning), which is occupied with how computers can or do support learning in collaborative settings.

In phase one of the study, all of the Explore Data assignments were examined with a *content analysis* (Berg, 1998). This showed that many assignments are built on a predict–observe–explain model. With this model, users must first predict the outcome of a variable cross-tabulation and must justify their prediction; then they describe what they see in the resulting table; and finally they must reconcile any conflict between prediction and observation. At first glance the predict–observe–explain model appears as the central circuit in a social science exploratory process. However, the assignments ‘short-circuit’ the process, because users’ are not encouraged to pursue their explanations by making variable tabulations on their own.

When solving an assignment, one is typically asked to hypothesise on a tabulation, then one must generate the table from variables specified in the assignment and in the end one is asked to relate the results of the table to the hypothesis. The problem, or the ‘short-circuit’, comes when moving on to subsequent assignments, because these assignments also have prespecified variables for tabulation. Thus, the reflection in earlier assignments has no consequence for how the statistical data is explored later.

In the assignments, entitled Explore Data, exploration is limited to the content of pre-selected statistics. The design of the assignments can have negative consequences for how social science is understood. For example, some assignments ask users to verify hypotheses with single tabulations. This reduces the concept of hypothesis to mere prediction, because only predictions can be verified. Within a scientific context, hypotheses are tentative, and cannot be conclusively verified. Another problem with the assignments is that they do not engage users in the theoretical groundwork for observation; that is, in determining why it was relevant to find the relation between the variables in the first place.

Clearly, the most important to NSD in their pedagogical design of the Explore Data assignments has been to convey *content* in the form of ‘statistical results’. The *process* of social science is not salient. The rationality behind this priority may be that NSD is not primarily a research institution. According to the statutes NSD is an institution with an obligation to convey data and information on Norwegian life and institutions to the educational system and the general public.

In the second phase of study, one student group in a technical college and one in a sixth-form college participated. The groups followed their regular class activity, and were recorded while solving Explore Data assignments. The work with a single assignment for each group was closely examined by *interaction analysis*.

The students in the sixth-form college had almost a year of experience with S-vev in citizenship. The assignment in the analysis had a predict–observe–explain structure. In their work with the assignment the students wrote a prediction, before secondly writing reasons for their prediction. Subsequently, they generated the table specified by the assignment and observed the results. In the end, they wrote how the results in the table harmonised with their prediction.

The assignment had asked them to test their hypothesis with a certain table, and had defined hypothesis as a prediction with a grounding. Yet, after the students had generated the table, they reviewed only the *prediction*, not their *prediction's grounding*. The students did not draw any implications of the results in the table, but moved straight on to the next assignment. When the horizon of the work is confined in single assignments, there is no need to review the grounds for predicting. Such review was not necessary for the students to continue working.

The students in the technical college had no prior experience with S-vev. Yet, they displayed a strong deliberation to generate the tables asked for in their particular assignment. However, they took no notice of prompts in the assignment to reflect on their work with NSDstat for Web. This illustrates that the Explore Data assignments allow students to complete the physical work with NSDstat for Web without reflection, and still come up with something they judged to be a legitimate outcome.

A characteristic of students' interaction found in both groups was that the students looked for 'assignments in the assignments'. This meant that they had an understanding of what their work should bring about; that is, of providing specific answers. The students displayed the rationality that the tables were important. By the tables they had something 'to show' to the teacher. The students on the sixth-form college additionally had a rationality of having something 'to say', in case they were picked out by the teacher to present their material.

In terms of learning, it is clear that the students on the technical college learnt to operate NSDstat for Web. They did not discuss the content of the tables. The more experienced sixth-form students had an advanced discussion on the patterns in the table. Still, they did not discuss *why* the patterns were as they were. Based on this, there is no evidence that the students were engaged in an exploratory process of social science.

NSD states that S-vev can engage students in an exploratory process where they can try the role as social science researchers. However, S-vev's implementation of the laboratory of social science runs into trouble that is well known from traditional laboratories in science education. Actions are specified in a step-by-step manner, reflection is not really required to perform the 'experiment' and students are not included in the theoretical groundwork for why the experiment was performed in the first place.

The results of study show that the assignments are pedagogically designed to provide students with citizenship content at the cost of an exploratory process. This makes a discrepancy between

stated pedagogy and pedagogical design. Although the literature states that net-based work can provide opportunities for inquiry-based activities (Reynolds, 2001), the students' work with the Explore Data assignments cannot be described as inquiry-based.

The discrepancy can be traced back to the authorities. In the tender competition for digital learning resources, the National Board of Education made four examples of projects that were likely to be commissioned. Two of the examples revolved around the textbook; one simply suggested to make the textbook electronic. This went against theoretical recommendations by facilitating only a content-led approach, instead of facilitating a combination of content-led and process-led approaches (see Selwyn, 2002; Whitworth & Berson, 2003). The suggestion did not fit with the constructivist language found elsewhere in the call for tenders.

An explanation for the discrepancy may be that the National Board of Education was uninformed about theory within the field of ICT and citizenship, and held electronic textbooks to be a creative pedagogical solution. Alternatively, the board spoke with two tongues; one speaking *pedagogy* and one *politics*. At the time the digital learning resources were initiated there was public pressure for free textbooks. A political argument stated in the initiative was accordingly to reduce students' expenses for textbooks. Hence, the suggestion of electronic textbooks may have been a way of meeting the public pressure.

This study shows a conflict between S-vev's focus on conveying content and the producer's stated focus on a student-led learning process. However, the National Board of Education could not expect the producers to resolve a conflict they did not resolve themselves. For future initiatives this implies that the authorities should be clearer on (and more conscious about) what is politics and what is pedagogy, and better; bring these to harmony.

Foreword

During my employment at the NSD I was taking part in the production of S-vev. This gave me expectations about how the digital learning resource would function in practice. Early spring 2002 I was included in the ITU Evaluation Project for Digital Learning Resources in Citizenship in order to do a study on S-vev. The work with this thesis has privileged me with an opportunity to observe S-vev in use.

A number of people have contributed to this study. First, I would like to thank my supervisors; Professor Barbara Wasson for great help in the formation of study, Eskil Flognfeldt Andreassen for valuable advice and Professor Berner Lindström for constructive guidance till the end of the work.

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1. INTRODUCTION

‘This day marks a great leap forward for educational Norway’, the Minister of Education, Trond Giske proclaimed as he officially launched three digital learning resources in citizenship (Læringssenteret, 2001, August 28, p. 2, my translation). For the first time in Norway systematic efforts to provide free digital learning resources for students at the college level were undertaken (ibid.). The Ministry of Church, Education and Research were initiators, and the National Board of Education implemented the initiative. To learn from their venture, the board initiated an evaluation project on the three learning resources. The Network for IT-Research and Competence in Education (ITU) lead the project.

This study is part of the ITU evaluation project and concerns one of the digital learning resources, S-vev, developed by the Norwegian Social Science Data Service (NSD). S-vev was commissioned by the National Board of Education on the basis of a programme set to advance creative pedagogical solutions (Læringssenteret, 2001b).

S-vev is based on a creative pedagogical idea in the sense that it is trying to implement the laboratory in citizenship education. The pedagogic concept of the laboratory is well known from science education. The idea of the laboratory is to provide students with the raw material of their subject as well as with instruments and tools for observing, handling and analysing this material. According to NSD, this can be accomplished in social subjects, as well. S-vev provides students with *raw material* in the form of data sets about the society. In addition, S-vev contains a *tool* for making online statistical tabulations with the data sets. According to NSD, S-vev supports students in an exploratory process, enabling them to try the role as social science researchers.

A special type of assignment in S-vev, called Explore Data, was designed to guide the students in this. Thus, to access ‘creative pedagogical solutions’ in practice, this study deals with the Explore Data assignments and students’ work with them. A major interest in this thesis is the meeting between the producer perspective and actual student activity. To be able to say something about this, the producer perspective and the student activity are first analysed in their own right; as two phases of study. The first phase analyses the pedagogical design of the Explore Data assignments; which activity the producer envisions this design to support, and what the provided resources look like. A potential realisation of the ‘creative pedagogical solutions’ can first happen when the producer’s pedagogical perspective meets praxis. Two student groups at a technical college and a sixth-form college contribute to the second phase. This phase analyses interaction during students’ work with the Explore Data assignments and which resources are used in the interaction.

The rest of this thesis has the following structure. The ‘Background’ chapter starts to explain how S-vev came into being, from the political initiative to the implementation. Then there is a general

description of S-vev, before motivating the choice to concentrate on the Explore Data assignments and students' work with them.

Chapter 3, 'Positioning the Study', first positions the study in the research field of CSCL (Computer-Supported Collaborative Learning). Then, there is an overview of the field of citizenship, before presenting contemporary research; both research within ICT and citizenship, and research with related methodology to this study. Chapter 4, 'Theoretical Framework', gives an account of sociocultural theory, highlighting the chief roles of interaction and resources within this framework. A theoretical account of resources is relevant to understand the making of S-vev as a resource, and subsequently of the ways various aspects of S-vev can be made into resources in students' interaction. Chapter 5, 'Research Aims and Design', states an aim to relate the producer's pedagogical visions and design of S-vev with actual student activity, and suggests that these two perspectives are studied in separate phases before they are compared. It is argued that the methodology of ethnography is a natural choice for a broadly outset, sociocultural study. Research techniques are dealt with in two chapters, one for each of the two phases of the study.

The subsequent chapters are sectioned in Phase I, 'The Producer Perspective', and Phase II, 'Praxis'. The Phase I section starts with chapter 6, 'Techniques and Data' that motivates and describes the research techniques and presents the empirical material. The analysis of Phase I is done in chapter 7, 'Analysis of the Explore Data Assignments', using the techniques content analysis, task analysis and document analysis. The Phase II section similarly starts with a 'Techniques and Data' chapter, chapter 8, with the same structure as the corresponding chapter in the Phase I section. The Phase II section contains the two analyses 'Analysis for the Sixth-Form College', chapter 8, and 'Analysis for the Technical College', chapter 10. Each of these analysis chapters first gives an ethnographic description of the setting, then applies the technique of interaction analysis and finally discusses findings.

After the two phases of study, chapter 11, 'Discussions and Conclusions', concludes the two phases, relates their findings according to the research aims and positions the findings in relation to other studies. The chapter continues by discussing the quality of the study, and closes by suggesting in what direction future research can proceed.

2. BACKGROUND

2.1 The Initiative for Digital Learning Resources in Citizenship

In the 2001 Annual Plan for ICT (information and communication technology) in Norwegian Education (KUF, 2001) the Minister of Education Trond Giske announced that within the start of the school year 2001, digital learning resources would be available in the citizenship subject for college level students. Further, a plan for long-term work with development of digital learning resources for the period 2001–2003 would be issued. Before 2001 there had only been small-scale development and testing of digital learning resources in Norwegian schools.

The National Board of Education¹ authored the plan, called Plan for Digital Learning Resources 2001–2003 (Læringscenteret, 2001b), and the digital learning resources in citizenship became its main initiative. At the time the annual plan was written there was public pressure for free textbooks at the college level (e.g. Granviken, 2000; Olsen, 2000; Rød Ungdom med gratis skolebøker på internett, 2001). Thus, a prominent argument in the plan was that transfer from textbooks to digital learning resources would reduce the students' expenses for learning material. The school authorities financed the development and maintenance of the digital learning resources in citizenship, so that they would be available free of charge for two years. The idea was that a combination of the digital learning resources could replace the traditional textbook in citizenship. The two years were additionally meant to be a trial period for gaining experience to support future policies on digital learning resources.

The National Board of Education specified the formal requirements for the digital learning resources, a tender competition and the selection of three winners. About 12 million NOK (excluding VAT) were apportioned Aschehoug (about 6 million), Cappelen (about 1 million) and the Norwegian Social Science Data Service NSD (about 4 million). Aschehoug made 'Samfun.net' (www.samfun.net), Cappelen made 'Samfunslære på Nett' (www.spn.no) and NSD made 'S-vev' (www.S-vev.no). The National Board of Education's call for tenders made clear that the producers would have to commit to a broad evaluation. The evaluation task was assigned the Network for IT-Research and Competence in Education (ITU), and called ITU Evaluation Project for Digital Learning Resources in Citizenship, Second School Year of College Level Education.

The current study is part of the evaluation project. Apart from one other research master's thesis, this study is the only one to focus on S-vev. It is therefore natural to have a broad scope on the

¹ Norwegian: Læringscenteret. Currently named The Directorate for Primary and Secondary Education (Norwegian: Utdanningsdirektoratet).

study, to be best able to contribute to the evaluation. In search for a point of departure, the goals of the initiative will be consulted.

The Plan for Digital Learning Resources 2001–2003 states that its programme is oriented towards progression, and that it should generate new knowledge and experience on the development of digital learning resources. The following excerpt shows some of the ambitious goals²:

The initiative for digital learning resources is intended to incite learning resources that advance creative pedagogical solutions, discipline crossover and working methods in accordance with the intentions in the National Curriculum for the elementary and college level schools. The digital learning resources are going to contribute to a more flexible and customised education, and promote active learning. (Læringscenteret, 2001b, p. 1, my translation)

As the ambition in the plan was to generate new knowledge and advance creative pedagogical solutions, it is to be expected that the winners of the tender competition for digital learning resources in citizenship were selected because of a creative pedagogy in their described products.

When studying S-vev, it is therefore natural to try to find out about this pedagogy. To get an impression of the pedagogy that the school authorities decided to ‘commission’, one could look at the press release the 5th of June 2001, immediately after the National Board of Education had made contracts with the tender winners. Here, the Ministry of Church, Education and Research³ announced NSD’s winning project in the following way (KUF, 06-05-2001, my translation):

The Norwegian Social Science Data Service is going to develop a web-resource that stimulates to the student’s role as researcher. The web-resource will serve as a self-contained resource or as supplement to other learning resources. The web-resource will thematically cover all the five main objectives in the topical National Curriculum.

The objective is to make a meaningful frame for the use of ICT, and to stimulate to its employment. The pedagogical idea is that the student in company with data resources and sources, through self-employment and experimenting, will gain knowledge and understanding about the society in which they live. Within the five main areas of the service, there will be an instructional arrangement with opening texts and problem areas. The student will be offered a tool for exploring and analysing data, which extend over the countries of the world to municipalities in Norway. In addition, a platform for cooperation among schools will be offered with the opportunity to carry out own surveys, and separate resource pages for the teachers.

² The Appendix contains translated quotes in Norwegian, sorted by the page they appear in this text.

The press release states that NSD's learning resource will stimulate to the student's role as researcher. This goal can be found both in NSD's tender application (NSD, 2001c) and in the contract between the National Board of Education and NSD (Læringscenteret & NSD, 2001). The goal appears to be an attempt at expanding the traditional student role.

According to NSD, S-vev is founded on NSD's pedagogical platform 'the laboratory of social science'⁴ (NSD, 2001c). This is an analogy for the more common laboratories in science education. An early NSD document gives the background for the pedagogical platform:

Although borrowed from the sciences, the concept of laboratories may as easily and successfully be applied in disciplines concerned with the study of society. The very idea of the laboratory is to provide students with the raw material of their subject as well as with instruments and tools for observing, handling and analyzing this material. (Ryssevik, 1994, section 2, para. 1)

As an implementation of the laboratory of social science, S-vev will provide students with 'raw material' from the social sciences and a 'tool' for analysing the material. Although there is a knowledge base on lab work in science education, there is limited research on lab work in social subjects.

By taking lab work across disciplines, S-vev can possibly be a contribution to 'advance creative pedagogical solutions' and 'promote active learning', as called for in the National Board of Education's plan. Thus, the pedagogical design of S-vev can be fruitful to study. Needless to say, pedagogical solutions are only solutions if they work in praxis. Therefore actual student activity with S-vev should be studied, as well.

Along with the pedagogical design of S-vev, the pedagogy in praxis provides focal points of the study. To better understand how NSD's envisioned pedagogy is sought realised, S-vev will be described in general. S-vev is a comprehensive collection of resources, and some may be more relevant than others to the NSD goal of stimulating to the student's role as researcher. The general description gives a background for concentrating the study on particular parts of S-vev, and students' work with these parts.

2.2 Description of S-vev in General

S-vev is a digital learning resource for citizenship at the second form level in college level schools. It was publicly available at www.S-vev.no September 1, 2001. The learning resource

³ Norwegian: Kirke-, Utdannings og Forskningsdepartementet. Currently named The Ministry of Education and Research

⁴ Can alternatively be translated 'the laboratory of social subjects'. Norwegian: Det samfunnsfaglige laboratorium.

gives access to databases with information about Members of the Parliament, election results and results from the school elections, party programmes and press releases from political parties. S-vev also has a tool for real-time statistical analysis that is called 'NSDstat for Web'. The instructional part of S-vev is covered by thirty-five Plans of Work containing reading matters and interactive tasks and assignments.

Figure 1: Overview of S-vev (NSD, 2001a, my translation).



Below is first a presentation of the tools and data resources in S-vev, and then of the Plans of Work.

A number of supplementary S-vev resources are worth mentioning, but will not be further presented; these are an introductory 'method and statistics' section, help sections for various parts of S-vev and an 'about S-vev' page on the pedagogical foundation and a section for teachers with advice on how S-vev can be used in the education.

2.2.1 Tools and data resources

The following will present the various data resources and tools for information retrieval and communication in S-vev. To get a richer impression, it is recommended to visit www.S-vev.no.

NSDstat for Web

NSDstat for web is a server-side statistics engine with a web interface. Users can choose from a number of data sets, and analyse variables of their choice. The options for statistical analysis are cross-tabulation, frequency-distribution, relative frequency-distribution, thematic maps and listings of data. The user can choose the presentation format of the statistical results. The default presentation format is table, whereas other common formats are bar and pie chart. The data available in the statistics engine are

- 37 data sets from national and international surveys;
- 4 data sets about Norwegian municipalities (with map data); and
- 4 data sets about countries in the world (with map data).

Figure 2: Result of tabulation in NSDstat for Web



Additional databases

In addition to the data in NSDstat for web, there are other data in databases available through web interfaces. The following databases can be searched for words or phrases, and returns documents where the search terms appear:

- party programmes from the major parties 1993–2003; and
- press releases from political parties for the recent years.

The following databases cannot be searched, but the students can display the information by specifying geographical areas and time intervals:

- information about Members of the Parliament 1945–2003;
- election results from 1945–2003 for Norwegian municipalities (Parliament elections); and
- school elections results 1989–2003.

Web Forum

Eighteen out of thirty-five Plans of Work contain an interactive element called ‘Write Your Opinion’. This element calls for students’ opinion on an issue related to the reading matter, and supplies a text field where they can answer. Answers are inserted successively into a web forum. The web forum is an independent section in S-vev, and can be used without entering by the link from Write Your Opinion blocks.

Own Surveys

S-vev has a section called ‘Own Surveys’ containing five standardised surveys with predefined answer alternatives. Classes can answer the surveys on the web, resulting in an on-the-fly report on the distribution of the different values of the answers. From time to time, NSD publishes data sets compiled by answers from all classes on each of the surveys. The data sets can then be analysed in NSDstat for web. In addition, it is possible for two or more classes to join and compose their own survey. This is in turn published on S-vev and can be answered in the same manner as the pre-made surveys.

Key Word Database

All Plans of Work have a block of key words on the last page, explaining central terms appearing in the reading matter. A separate key word section outside of the Plans of Work makes it possible to search for or list key words from one or several Plans of Work.

Categorised link collection

Underneath the block of key words, every Plan of Work has a block with links to relevant web pages. These links have been collected on a separate web page and organised thematically.

2.2.2 Plans of Work

Thirty-five Plans of Work constitute what may be called the instructional part of S-vev. The plans are organised around five main themes corresponding to the main parts of the National Curriculum. The length of the Plans of Work averages at six web pages (optionally, all the content can be displayed on a single web page). The major part of a Plan of Work is occupied by reading matter. Each of the first four pages typically holds reading matter and maybe an interactive task.

Figure 3: First page of Plan of Work ‘Cultures Collide’

s-vev.no VEL NYNORSK | LÆRERENS SIDER | OM S-VEV | SØK:

Samfunnslære | NSDstat for web | Dataressurser | Egne undersøkelser | Diskusjon

Det politiske systemet | Individ og samfunn | Arbeids- og næringsliv | **Kulturforståelse** | Det internasjonale samfunnet | Nøkkelord | Lenker

Du er her: Samfunnslære > Kulturforståelse > Kulturer kolliderer

Kulturer kolliderer SIDE 1 | 2 | 3 | 4 | 5 | 6 | Alle

24 kbps | 56 kbps

Norge blir regnet for å være et *homogent* samfunn, noe som betyr at innbyggerne er regnet for å være ganske like. En sier gjerne at det finnes en norsk kultur fordi vi deler samme kunnskap og historie og de samme skikkene. *Kultur* er med andre ord avgjørende for hvordan en oppfatter og oppfører seg i dagliglivet. Ofte får vi høre at det er et norsk kulturtrekk at vi er avvisende og stille når vi møter fremmede. Guttene er ikke like pågående når de flørter med jentene som det italienske gutter er, og vi forteller sjelden livshistorien vår til en fremmed person på bussen. *Kultur* handler altså om rollelære. Vi lærer gjennom livet hvordan vi skal tenke og oppføre oss. Denne læringen er for en stor del ubevisst. Vi tenker sjelden på at en faktisk oppfører seg og tenker som en nordmann.

Til tross for at en regner Norge for å være et homogent samfunn, finnes det indre kulturelle forskjeller i landet. Mest vanlig er det nok å peke på at fremmedkulturelle innvandrere har vært med på å endre det norske samfunnet. Kristendommen er blitt litt mindre dominerende, maten er blitt mer krydret og det språklige mangfoldet har økt. Der er likevel viktig å presisere at samfunnet ville ha endret seg selv om ingen fremmedkulturelle grupper hadde kommet til Norge.

Kan du tenke deg noen grunner til at samfunn endrer seg over tid?

Vi trenger ikke lete mellom nye innvandringsgrupper for å finne minoriteter som skiller seg ut ved kulturelle særtrekk i Norge. Landet har alltid hatt ulike folkegrupper, nordmenn og samer. På 1960-, 1970- og 1980-tallet satte flere internasjonale organisasjoner søkelyset på vern av sivile og politiske retter for minoriteter, urfolk og stammefolk. På grunn av dette ble Samerettsutvalget opprettet i 1980. Dette utvalget kom med forslag om å opprette et eget Sameting og en lov om samiske rettsforhold. Sameloven ble vedtatt i 1987, i 1988 ble samenes retter skrevet inn i Grunnloven og den 9. oktober året etter åpnet Kong Olav det første ordentlige sametinget.

Miniundersøkelse

I den offentlige debatten kommer spørsmålet om innvandring stadig opp. Betyr dette at spørsmålet er spesielt viktig i norsk politikk? Nedenfor kan du gjette på hva som er den største innvandringsgruppen i Norge.

Før du går videre, kan du svare på spørsmålene nedenfor. Grunngi for deg selv hvorfor du krysser som du gjør.

Svaralternativer:

- Storbritannia
- Bosnia-Hercegovina
- Marokko
- Danmark
- Vietnam
- Pakistan
- Sverige

eller [Se resultater](#)

[Gå til neste side](#)

Kleskoden på denne skolen virker nok litt fremmed for de fleste elevene i den norske skolen.

A limited set of interactive tasks are drawn on. These are Mini Inquiry (simple polls with instant feedback on how many have chosen the different alternatives), Insight Assignment (which can mainly be solved with web resources outside S-vev) and Write Your Opinion (with gateway to the web forum). The second last page in a Plan of Work contains Explore Data assignments (drawing on the NSDstat for web). The last page consists of Key Words (explaining central terms appearing in the reading matter) and Related Links (to external web pages related to the current theme). The elements that have been presented in this paragraph constitute the building blocks of the Plans of Work. The building blocks are graphically set apart with distinct icons as they appear on the pages.


The reading matter is similar to that of textbooks, but includes more facts and statistics from the data resources. Tables in the reading matter are normally accompanied by a link in the format

‘Open [name of survey] in NSDstat for web’ that, if followed, opens the table in the NSDstat for web environment. The aforementioned Explore Data assignments constitute a clear link between the Plans of Work and the NSDstat for Web environment.

Explore Data assignments

The Explore Data assignments are the most common tasks in the Plans of Work. Each of the 35 Plans of Work has at least one section with Explore Data assignments. The total number of Explore Data sections is 44. Most Plans of Work (29) have only one Explore Data section. The example below shows the Explore Data section in the Plan of Work ‘Racism – understand, act, and change!’

Figure 4: Explore Data assignments in Plan of Work ‘Racism’ (My translation).



EXPLORE DATA

You can now continue to work with the data set "*Fellow Citizen Inquiry 2001, Youth Sample – selected variables*".

1. In the data set you will see that it has been asked questions about several groups in the society. Find out which group the youths would like the least to have as next-door neighbour.
[Open "Fellow Citizen Inquiry 2001, Youth Sample – selected variables" in NSDstat for Web](#)
2. Are there differences in the attitudes of girls and boys? Write down what you believe before you enter the data material to find the answer. Use NOT NEIGHBOUR, ... as dependent variable and GENDER as independent variable. Was the result as you believed? What can explain this?
3. Let us assume that not wanting Islamic fundamentalists as neighbours is a sign of fear of the unfamiliar, could we then based on the data material say something about where in the country there is most fear of the unfamiliar? Once again you should write down what you think before you enter the data material. Use NOT NEIGHBOUR, ISLAMIC as dependent variable and REGION as independent variable. Was the result as you believed? What can explain this?

As a rule, the Explore Data sections start with a paragraph stating which survey or surveys will be used in the assignments. Sometimes the paragraph recapitulates what the theme has been so far in the Plan of Work. Then the actual assignments follow, further contextualising the work with data.

2.3 Concentrating on a Specific Part of S-vev

The number of resources in S-vev makes it apparent that students will not use all. The scope of the study would be too broad if *all* the pedagogical solutions in S-vev were to be analysed. It is therefore necessary to try to identify the resources in S-vev that are closest related to NSD’s pedagogical goal with S-vev.

The NSD goal for S-vev is to ‘enable students to participate in a process where knowledge is created through the gathering and analysis of relevant information’ (NSD, 2001a, my translation). The goal gives the impression that S-vev will provide guidance in such a process. Outside of the meta-information on for example the help pages, it is the Plans of Work that can best be described as guiding a process, with instructions and assignments suggesting an activity for students.

What is unique in S-vev compared to other digital learning resources, as for example Aschehoug's Samfun.net, is a statistics engine and data resources. Since the mid-eighties NSD has been providing the educational system with statistics software and data resources. With S-vev, this is for the first time available online. The statistical engine in S-vev, NSDstat for Web, takes advantage of the latest technology from the ongoing international project NESSTAR (Networked European Social Science Tools and Resources) funded by the European Union. NSD is one of the contributors to the project. A person central in NSD's project commitment and previously central in NSD's work with digital learning resources knew of no web-based learning resource for the college level or lower that had similar opportunities for statistical analysis to NSDstat for Web (J. Ryssevik, personal communication, autumn 2004). NSDstat for Web thus represents both new technology, and new applications of this technology. The data resources and NSDstat for Web enable 'gathering and analysis of relevant information', as the goal for S-vev stated. However curiously, most types of assignments in S-vev rarely employ these resources.

One type of assignments, though, the Explore Data, is applying NSDstat for Web. The Explore Data assignments consist of textual resources that contextualise the work with NSDstat for Web, and gives directions for operation. By analysing the Explore Data assignments one may be able to say something about how NSD portrays the process of working with NSDstat for Web, and which resources NSD supplies to support this process.

Unlike other assignment types, the Explore Data type of assignments is present in every Plan of Work. Predecessors of S-vev are based on similar assignments. From this, one can infer that the assignments are designed to have an important role in the student's work. The Explore Data assignments can be argued to be the resources in S-vev that are closest related to NSD's pedagogical goal with S-vev. The study will thus concentrate on the Explore Data assignments, and students' work with these.

3. POSITIONING THE STUDY

Although this study addresses the theme of ICT and citizenship, it can be positioned within a more clear research field.

3.1 The research field CSCL

CSCL (Computer-Supported Collaborative Learning) is an approach to research on technology for learning. The term computer support covers a variety of computational tools for learning. Similarly, the term collaborative learning covers situations ranging from two individuals performing a task together, during a short period of time, to large groups of students following the same course and interacting via the worldwide web.

According to Koschmann (1996), CSCL can be seen as a new paradigm within research on technology for learning, in the sense that its view on learning and instruction is largely incommensurable with views from earlier paradigms. Koschmann gives a chronological synopsis of these views, and relates traits in the development of instructional technology to the ascendant view in each period in time.

The earliest paradigm is called CAI, which stands for Computer-Assisted Instruction. Here, the instructional technology is influenced by behaviourist theories of learning. At the front is instructional efficacy, sought realised through programmed instruction. The ITS paradigm, short for Intelligent Tutoring Systems, relies on Information Processing Theory. The student is seen as a cognitive unit and technology as a personal tutor that can convey information appropriate to the current knowledge level of the student. The research thrust is laid on making the systems intelligently adapt to different states and levels of knowledge. The Logo-as-Latin paradigm is different in that there is no predefined knowledge to be imparted in students. The theoretical stance is cognitive constructivist, where students are seen to construct their own models of knowledge. An instructional goal is to make students self-governed learners, and to assist them in developing general skills for learning and problem-solving. Technology is here seen as a tool for construction. Students use computers to construct own programs or simulations, often with the programming language Logo. The research is concerned with identifying and measuring general cognitive skills resulting from such activity. CSCL, the last paradigm, has not supplanted the earlier paradigms. It is further presented as a separate approach.

CSCL is both concerned with research and design of learning environments, included the technology. Research on current design solutions informs the design of new solutions, which in turn can be subject to research. The research methodology of the field states that one cannot

simply study the technology, but must always include the whole learning situation. This is reflected in the current study, as students' interaction with each other and the technology is studied in their natural setting.

CSCL is theoretically influenced by sciences devoted to understanding aspects of the social setting. Students are not studied in isolation, the central phenomena of study is their engagement in sociocultural activity. Important topics of research have been to examine the effects of learning from a particular kind of interactions, and to find ways to support learners to engage in the kinds of interactions that have been found to be instructionally effective. The current study will examine students' interaction, and characterise this in pedagogical terms. The intention is not to make normative claims about effective interactions, but to identify characteristics of interaction that is related to a certain technological tool.

The CSCL field includes research on technology within a variety of disciplines. The rest of the chapter will concentrate on the citizenship subject.

3.2 An International Look at Citizenship Education

There has been gained little documented experience with the development and use of digital learning resources, therefore digital learning resources in citizenship must be followed by research. This states the National Board of Education (2001b) in their plan for digital learning resources. Because of the limited research, the current study will look abroad for an overview of the research on ICT and citizenship. The Norwegian citizenship school subject must therefore be related to international citizenship school subjects. In the subsequent section, studies related to the current will be presented.

In many countries, citizenship is not a discrete school subject. Kerr (1999) in an international comparison of citizenship education found that the citizenship education is covered by a wide range of terms and comprises many subjects:

These terms include citizenship, civics, social sciences, social studies, world studies, society, studies of society, life skills and moral education. The area also has links to curriculum subjects and options, including history, geography, economics, law, politics, environmental studies, values education, religious studies, languages and science. The range of terms and subject connections underlines the breadth and complexity of the issues addressed within this area. (Kerr, 1999, pp. 6-7)

Internationally, citizenship is therefore best defined as a subject area. Kerr defines the area like this:

Citizenship or civics education is construed broadly to encompass the preparation of young people for their roles and responsibilities as citizens and, in particular, the role of education (through schooling, teaching and learning) in that preparatory process. (ibid., p. 6)

The Norwegian subject 'samfunnslære' comes under this definition. The first lines of the National Curriculum for samfunnslære echoes the above objective: 'Norway has long democratic traditions to care for. A modern and living democracy presupposes ability to critical thinking, participation and involvement from the mass of the people. Here, the school has an important and challenging job to do.' (KUF, 1994, p. 1) Samfunnslære is taught in all lines of study, underlining the subject's preparatory role for all Norwegian young citizens. When the Norwegian word samfunnslære was translated in this study, it was natural to consider the two English words citizenship and civics. For illustration, the United States has a subject with the name civics, whereas the United Kingdom has a subject named citizenship. Although the two terms are often used interchangeably, it can be argued that they have a different accentuation of meaning. Selwyn (2002, p. 8) discusses the terms:

'Civics' and 'civic education' are more often associated with education which stresses knowledge about civic elements of society, whilst 'citizenship' denotes a more participative and active learning process (Cogan & Morris, 2001). In this way, citizenship education can be seen as running on a passive/active continuum – passive citizenship being the product of an education which seeks to develop knowledge, understandings and behaviours of citizenship, and active citizenship which augments this passive model with an ability to critique, debate and propose alternative models of the structures and processes of democracy (Arthur & Davidson, 2000).

Here, the account of 'civics' accentuates a focus on factual knowledge and understanding, whereas the account of 'citizenship' accentuates active participation and the ability to propose new alternatives to the given.

A closer look at the Norwegian National Curriculum for 'samfunnslære' explains how this subject is not restricted to imparting knowledge about civic elements of society, but encourages a more participative and active learning process. The curriculum states that the students are going to 'gain knowledge about how society works, and how they can contribute to shaping the future themselves' (KUF, 1994, p. 1, my translation). The synthesis of knowledge and participation is further stated in that the students should 'gain insight into politics and civic life to be able to care for and develop our democracy' (KUF, 1994, p. 3, my translation). Other perspectives from the curriculum highlight values, ethical skills and skills for discussion and communication. Matching with an accentuation of citizenship as participation and active learning, the curriculum states that samfunnslære is a subject that is natural to include in interdisciplinary projects within all lines of

study, and requires that at least one such project be undertaken. When it comes to evaluation, the curriculum is clear that the students' maturity and capacity for independent and critical thinking should be included. On this basis, the Norwegian subject *samfunnslære* is translated 'citizenship'.

The current study is pursuing creative pedagogy related to *S-vev* in citizenship. Pedagogy is not only related to the contents and processes in a subject, but to the goals, as well. Kerr (1999) in an international comparison of citizenship education found differences in pedagogical goals in citizenship education. He illustrates the differences with a model by Blyth (1984), which demonstrates three strands that citizenship education can comprise. With Selwyn's continuum of passive and active citizenship in mind, Blyth's model is useful to link contents and processes with intended goals in citizenship education. The model is supplied below (as presented in Kerr, 1999, p.14; Selwyn, 2002, pp. 8-9).

- Education ABOUT citizenship: providing students with sufficient knowledge and understanding of national history and the structures and processes of government and political life.
- Education THROUGH citizenship: students learning by doing through active, participative experiences in the school or local community and beyond. This learning reinforces the knowledge component.
- Education FOR citizenship: encompasses the 'about' and 'through' strands and involves equipping students with a set of tools (knowledge and understanding, skills and aptitudes, values and dispositions) which enable them to participate actively and sensibly in the roles and responsibilities they encounter in their adult lives.

Blyth's model demonstrates a combination of teaching and learning approaches. The strand 'education about citizenship' is a content-led approach, whereas 'education through citizenship' is process-led. The 'education for citizenship' strand combines both content and processes in its approach. According to Selwyn (2002), contemporary educational thinking stresses the need to enable the 'education for citizenship' approach, reflecting the multi-faceted nature of the subject and variety of potential methods of delivery. Kerr (1999) found that internationally there is a move away from a content-led approach to citizenship to the broader 'education for citizenship' approach.

The previous discussion set off by pointing out that the sparse empirical research required an international view of the research in the area. The international area of citizenship education was discussed, and the Norwegian citizenship subject was positioned in the area. The contemporary educational thinking on the goals, content and processes of citizenship education was also briefly presented. The subsequent section will elaborate on the topic of ICT in citizenship education.

Before approaching the topic of ICT in the Norwegian citizenship subject, it should be noted that the recent political initiative for digital learning resources makes a new turn for the subject – the initiative is not an answer to ICT demands in the curriculum. The general part of the National Curriculum (KUF, 1997) from 1997 treats issues of technology under a separate sub heading, while having no reference to ICT. The part of the National Curriculum specific for citizenship (KUF, 1994) from 1994 does not bring up ICT other than in the foreword, which simply states that schools are expected to have provided the necessary equipment to use information technology in education within five years (which makes year 2000). Thus, there is no guidance in the curriculum on how ICT should be approached in the subject, what could be expected of ICT or how it should be used.

3.3 Research on ICT in Citizenship Education

In the following, three literature reviews dealing with ICT and social studies/citizenship will be presented. The literature reviews are written by researchers from three continents, thereby permitting diverse voices of educational thinking and research in the area. Following the reviews, a study conducted by NSD on the use of statistics in the social studies area will be presented. Further, there is a study using one of the same research techniques as the current study, and analysing a related case. The last study presented is on S-vev in use.

‘Literature Review in Citizenship, Technology and Learning’

NESTA Futurelab is a British programme aimed to ‘transform the way people learn by using new and emerging technologies to create educational resources that are involving, interactive and imaginative’ (NESTA Futurelab, 2005, para. 1). ‘Literature Review in Citizenship, Technology and Learning’ (Selwyn, 2002) is part of a series of NESTA Futurelab reports which seek to identify where the knowledge base is weakest and give future directions for research on how to make best use of technology for learning. These areas of the review’s findings are reported in the following presentation.

The review notes Kerr’s (2000, p. 16) observation that: ‘One of the key points to emerge from the literature in the area is that we have only a limited knowledge and understanding of what actually happens in citizenship education in schools, classrooms and elsewhere. Little systematic research has been conducted since the 1970s.’ Adding to this observation of citizenship research in general, the review concludes that: ‘Whilst there is much theoretical writing there has been little, if any, high calibre research carried out in the area of citizenship and technology.’ (Selwyn, 2002, p. 24)

With reference to the previously explained theoretical strands of education ‘about’, ‘through’, and ‘for’ citizenship the review states that much effort has been on ICT applications supporting the ‘education about citizenship’ strand, by delivering citizenship content. The research on the

effectiveness of delivering content in this way is noted to be scarce or non-existing. By drawing parallels with a 'general academic consensus' questioning the lasting effects of young people's use of news media, it is suggested that increased access to citizenship information should not be seen as necessarily leading to increased levels of citizenship. It is therefore concluded that from a pedagogical perspective the passive presentation of citizenship information via ICT is not best practice. The review suggests that future ICT applications need to concentrate on supporting the education 'for' and 'through' citizenship strands.

A key point in the review is that some questions about citizenship and technology cannot be rigorously researched and satisfactorily answered. The broadly defined outcomes of citizenship makes it difficult to try to measure many of the outcomes and, it follows, the effectiveness of ICT in creating informed citizens. The review partly attributes the dearth of robust empirical research to this difficulty of measuring outcomes, and proposes that the key and cutting edge questions surrounding citizenship and new technologies are more likely to be theoretical and exploratory rather than empirical and definite.

'Computer technology in the social studies'

Just like Selwyn (2002) above, Whitworth and Berson (2003) found that ICT applications are currently focusing on delivering content. This was concluded in their literature review 'Computer technology in the social studies: An examination of the effectiveness literature (1996–2001)', which was aimed at determining how far the field has come and to assess the trends and patterns of technology use. The literature base was publications from the National Council for the Social Studies (NCSS) and over 300 other technology related articles, chapters, books and government reports (the NCSS is a United States based umbrella organization for elementary, secondary, and college level teachers in the social studies field). The technique *content analysis* was applied on the literature to bring out the result:

If the findings of this study are representative of social studies education and classrooms, then it appears that computers continue to serve the primary function of facilitating students' access to content and remain somewhat relegated to being an appendage to traditional classroom materials. (Whitworth & Berson, 2003, p. 483)

Yet, the researchers note a slight emergence of activities that enhance civic competence and critical thinking skills while using internet resources. These are activities that require students to critically evaluate content they encounter on the internet. Such activities can be telecollaboration, webquest activities and lessons. Where Selwyn pointed to a dearth of robust research, Whitworth and Berson point to a need for more publications including research that explore how computers in the classroom contribute to citizenship skills.

'HSIE 7–10 Literature Review'

The point of limited research within ICT and social studies is shared by Reynolds (2001). Having reviewed the literature in the social studies field, primarily from the period 1996–2001, she notes that most research is American with only few contributions from her own continent, Australia. However, the review draws attention to a potential value of technology to assist students to make new, personal knowledge. This resonates with the goal of S-vev of stimulating to the student's role as researcher (KUF, 06-05-2001).

The notion of students as social inquirers is found in books, as well. Reynolds notes that most Social Studies textbooks have explanations of an inquiry process with the essential tenet being that there is a sequence of activities to guide students through a meaningful social investigation. About the activity sequence in the inquiry process, it is further observed:

Although there are a number of different ways of classifying this sequence it basically revolves around a progression of framing and focusing questions; locating, organising and analysing evidence; evaluating, synthesising and reporting conclusions; possibly taking action of some sort; and reconsidering consequences and outcomes of each of the above phases... the inquiry process is recursive in nature, and depends upon a view that students are to be strongly involved in the inquiry process. (Reynolds, 2001, pp. 20-21)

The review remarks that some difficulties have been reported in implementing such activity sequences. This particularly concerns low achieving classes, due to students working from an insufficient knowledge base and a lack of self-discipline.

Reynolds concludes, however, that computer and net-based work can provide opportunities for inquiry-based activities. This is promising for S-vev and its goal of students as social researchers.

'From Chaos to Knowledge'

Students as researchers is also theme in the report 'The students in the role as researchers: Experience gained during the employment of the laboratory of social science' (Enger & Wilhelmsen, 2003, my translation). The report concluded 'From Chaos to Knowledge', a project funded by ITU and lead by NSD⁵.

The project is theoretically founded on NSD's pedagogical platform, 'the laboratory of social science'. The concept of a laboratory is borrowed from science education. In the project, the laboratory of social science is sought realised in practice among 1000 students from comprehensive schools and colleges. The 'raw material' available to the students is data sets from surveys, and the 'tools for observing, handling and analyzing' is NSDstat, NSD's software

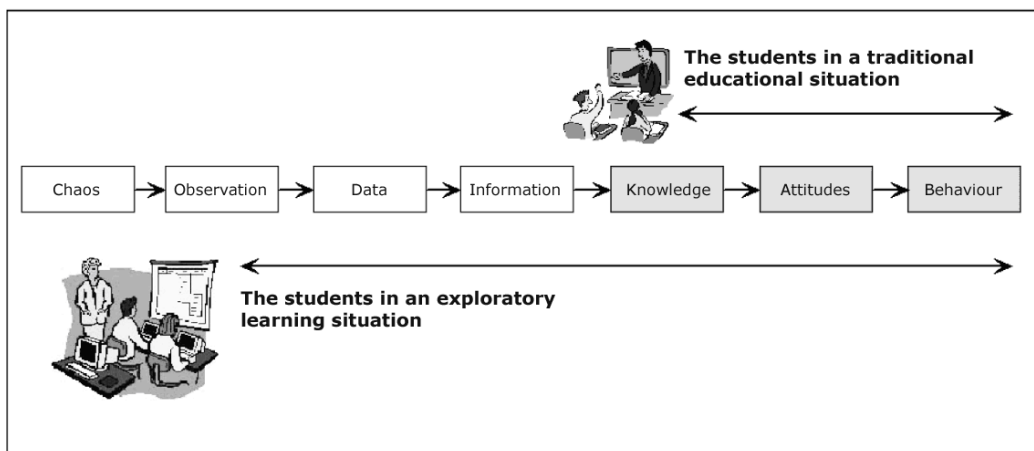
⁵ The project was conducted as a joint venture between NSD, the Bergen University College, the Department for Teacher Education and the Research Centre for Health Promotion by the University of Bergen. NSD was the legally responsible institution for the project.

package. In the project, students use ‘learning packages’⁶ from NSD to support the work. The learning packages are CD-ROMs containing texts and accompanying assignments to be solved with NSDstat.

One of the reasons why the project is related to the current study is that NSDstat and the learning packages are predecessors of S-vev. NSDstat is integrated in S-vev as ‘NSDstat for Web’, with a simpler functionality. The learning packages have been incorporated into S-vev in modified form: The texts are included among the Plans of Work and the assignments are included among the Explore Data assignments. According to the report, S-vev is ‘the newest version of the learning package concept’ (Enger & Wilhelmsen, 2003, p. 146, my translation). NSD states that the laboratory of social science underlies S-vev, as well. Consequently, ‘From Chaos to Knowledge’ may tell something about how NSD frames its learning products in relation to pedagogical traditions and the research community.

The idea behind the laboratory of social science is that instead of consuming ‘ready-made’ knowledge, students will themselves generate knowledge from chaos, by having access to both the data and the tools for statistical analysis. NSD compares the approach to traditional education in the following figure⁷.

Figure 5: Students’ place in the knowledge generation chain according to learning situation (Enger & Ryssevik, 2003, Figure 1, my translation)



The project tries out, and evaluates, implementations of the laboratory of social science. The learning packages have a central place in the implementations, being promoted as a resource with relevant information and assignments that demonstrate relevant statistical analyses.

The project comprised several studies, gathering empirical materials by interviews, questionnaires, video recording, dialogue and observation. More than 80 teachers and 1000 students from

⁶ The learning packages for Health Promotion were developed by NSD in cooperation with the Research Centre for Health Promotion by the University of Bergen.

⁷ The Norwegian text ‘forskende læringsituasjon’ was translated by ‘exploratory learning situation’.

comprehensive schools and colleges participated. The questionnaires asked for self-reported learning, and tried to find variables correlated with this, like for example peace to work in the classroom. These findings are not relevant to the current study. However, a qualitative prestudy will be reported.

The qualitative prestudy found that students had to gain a basic competence consisting of four main elements. The presentation of these competencies gives an impression of NSD's view of the laboratory of social science and of how NSD envisions the students to work. The presentation is based on Enger and Wilhelmsen (2003, pp.142-143):

Skills in using the software: The students must be trained in the NSDstat tool, and they need skills in using word processor and the worldwide web.

Skills in using the working method: The students must learn how to use the pedagogical model the laboratory of social science as a working method. The method has the following recommendations. The students start by finding some research problems, or relations, they want to investigate. The learning outcome will be greatest if the students prior to statistical analyses formulate the results they expect to find for their research problems, and why they expect just these results. The analyses are made and the results are judged against the expectations. Then the results are discussed and possible explanations of these results. Often, this will give a basis for new research problems, and a further investigation of the statistical data. The results will typically be presented in the end for the other students in class. The working method gives best results if the students work together in groups.

Understanding of terms: The students must understand central terms they will encounter during their work with NSDstat and the learning packages. Examples of methodical terms are 'research problem', 'variable', 'category', 'frequency-distribution' and 'cross-tabulation'. Examples of terms related to the subject are 'bullying', 'health', 'living together' and 'same-sex marriage'.

Understanding of the purpose of the work: The students must have sufficient information both in advance and during the work about the purpose of the work and what is expected as product. Teachers involved in the work should agree on the students' task and communicate it as uniformly as possible to the students.

The basic competence described above is comparable to Reynolds's (2001) description of a typical activity sequence in a student inquiry process. Both descriptions are concerned that students should carry out a meaningful social investigation.

'Approaching interactive-engagement tasks'

Like were the 'learning packages' in the project above, S-vev is built on the NSD's pedagogical platform, the laboratory of social science. By providing students with data, and tools for statistical representation and analysis of data, NSD enables the students to perform 'experiments' in the

same manner as in laboratories in science education. The pedagogical idea is to give students direct access to the building blocks of the subject, namely social science data.

Since the implementation of the laboratory of social science is new, it may be productive to relate to research on laboratories in science education. In recent years been attempts within science education to implement labs that give students the opportunity to engage in exploration of the basic concepts in the subject. One of these approaches is called microcomputer-based laboratory (MBL). Here, students are guided in their inquiry by carefully designed instructions, technology and teacher support. This approach has proven to be much more effective for learning science, than traditional labs have (Hake, 1998 in Lindwall & Bernhard, forthcoming). The MBL approach can thus be considered creative pedagogy.

Lindwall and Bernhard (forthcoming) have done an interaction analytic (Jordan & Henderson, 1995) study on students working with MBL. The study has methodological similarity to the current study.

Students in the study worked with probeware and associated assignments. The probeware made it possible to observe a graph generated in real-time by a computer using the students' bodily movements as input. The work with probeware had associated assignments, structuring the work in three phases. First, in the prediction-phase, the students were asked to discuss and agree on how to move in front of the detector. Second, in the performance phase, the students should match the pre-defined graph by walking in front of the motion detector. Third, in the evaluation phase, the students were instructed to discuss discrepancies between the pre-defined and the produced graph, and decide if the match between the graphs was good enough to continue or if they were going to make another try.

The researchers used videotaped material of students' interaction to investigate how the students approached the assignments based on probeware. Most of the times, the students discussed the relation between different phenomena and their representations, thereby constituting an interactive-engagement approach. A special focus was to detect those instances where the students did not act according to the teacher's intentions with the lab. At other times, however, students approached the tasks with another rationality. Rationalities taken by the students were for instance concentrating on the lab-report or a quick and easy completion of the task. In this manner, the students were using procedures disconnected to both representations and phenomena, and thereby avoiding conceptual issues.

Another master's thesis on S-vev

The ITU evaluation project for digital learning resources in citizenship includes several studies. However, most studies deal with either Aschehoug's learning resource, or issues concerning all resources collectively. Only the current study and a study by Westrum Hvammen (2003) treats

S-vev in particular. Westrum Hvammen has done a master's thesis on the use of S-vev in three classes with three different teachers.

Her sample of participants was made with an aim for variance. When selecting teachers she especially wanted variation in variables like age, sex and experience with internet use. However, several teachers were afraid to participate, and this affected the sample. What characterised the teachers in the study was that they were relatively skilful at using computers, and had employed ICT in education earlier.

The theoretical perspective of her study was situated learning, complemented with actor-network theory to better account for the introduction of new technology into practice situations. The techniques for gathering empirical materials were observations in the classroom settings, interviews with teachers and students, and document analysis of NSD's intentions with S-vev.

Westrum Hvammen found that statistics constituted such a great part of the digital learning resource that it came across as a mandatory part of the work. NSD's stated intention behind the assignments in S-vev is that the students should be able to try the role as social science researcher by using a tool to tabulate variables and generate statistics. The study showed that S-vev only to a limited extent managed to demonstrate the purpose of the assignments to the students. Instead of trying the role of social science researchers, the students replicated content by generating statistical tables, and by using copy and paste to transfer them to working documents in a word processor. The content of the tables were not discussed. Often the students generated statistics without any understanding. The students reported that it was hard to see the relation between their work and the rest of the citizenship subject.

The study found that limited computer skills and slow system response was a problem. Some students also spent much time on other activities, such as surfing the web and using chat software. Westrum Hvammen suggested that these factors contributed to the students' limited understanding, and subsequently, that they failed to relate their work to the overall work with the subject.

Along with this, a discrepancy between the work and the assessment in the subject was recognised. The students did not see which criterions the teacher used to evaluate their work with S-vev. They were afraid that this work did not contribute to their grades. The role of the teacher changed to be more of a supervisor role, and S-vev controlled the students' work. The students generally had the opinion that the work with S-vev made them collaborate less on the subject than they used to in their ordinary education. The collaboration was more about helping each other with technical problems, but the students did not define this as part of a learning conduct.

There was a difference between the three classes whether the students' work with S-vev stood alone, or was sought integrated in the citizenship subject by the teacher, for example by traditional teaching or class discussion.

The previous has presented literature reviews and related studies on ICT in citizenship. The literature reviews report of little empirical research (Reynolds, 2001; Selwyn, 2002). There is, however, a burgeoning theoretical literature, some of which was presented in the beginning of the chapter. Up till now, much effort has been on ICT applications delivering citizenship content (Selwyn, 2002; Whitworth & Berson, 2003). However, to encourage active citizens it is recommended to combine content-led approaches with student-active processes (Reynolds, 2001; Selwyn, 2002). S-vev appears to support this combination. Through the laboratory of social science S-vev provides students with data about society and tools for analysing data.

Since research on the laboratory of social science is limited, experience from creative pedagogical implementations of laboratories in science education will be drawn on, namely the microcomputer-based laboratory (Lindwall & Bernhard, forthcoming). To create knowledge from chaos, or to carry out meaningful social investigation, there are certain competencies (Enger & Wilhelmsen, 2003) or activities that must be learnt (Reynolds, 2001). The reported study on S-vev (Westrum Hvammen, 2003) offered general impressions of students' work with S-vev and the Explore Data assignments, indicating that students do not display the suggested competencies or pursue the recommended activities. It can therefore be useful with a closer look at the specificities of the Explore Data assignments, and students' work with them. The following theoretical and methodological accounts will provide for such analysis.

4. THEORETICAL FRAMEWORK

Theories, in a common sense, are the ways people look at the world, which in turn influence the choices people make in their lives. Just like there is an apparent diversity in ways of thinking about the world among people, there is a diversity of theoretical stances within the academy. The researcher too, approaches the world with a set of ideas, a framework (theory, ontology) that specifies a set of questions (epistemology) that he or she then examines in specific ways (methodology, analysis) (Denzin & Lincoln, 2000). Within the scientific community it is important to be explicit about one's theoretical point of view, because of its decisive character of the research process. By explicating the theoretical stance the non-arbitrary character of the research act can be accounted to the reader. Furthermore, by gaining access to the theoretical stance, the reader can examine and debate it.

4.1 Sociocultural Theory

The current study draws on sociocultural theory. In fact, sociocultural theory is a collective term for a number of distinct, yet related theoretical perspectives⁸. Therefore, the presentation will concentrate on concepts common for the perspectives, and relevant to this study.

Common in the perspectives is an emphasis on people's actions as embedded in the sociocultural. Knowledge first lives on the social plane, in the interaction between people (Säljö, 2001). This can first be illustrated by a historical perspective.

Through the historical cultivation of language, people could share their ideas about the world. When written language later emerged, this greatly increased interaction between people. Now people could interact by language without being face to face. In addition, written texts could live through generations, and people did not have to memorise all the wisdom of the past for the younger generations. In a sense, written language enabled generations to interact across time, causing an accumulating knowledge base that was applied in new contexts. This illustrates a central principle of sociocultural theory that all interaction between human beings in some sense involves that knowledge, judgements and skills are transferred to new contexts (Säljö, 2002).

The increased knowledge and skills periodically contributed to the production of new artefacts (literally: manmade objects). Artefacts are cultural tools designed to gain certain properties (Säljö, 2002). Examples of artefacts through our history are bow and arrow, paper and pencil, the wheel, the car, and the computer. Artefacts contribute to knowledge being used in new contexts; they can exist through time, and reach other users than the inventors. An important point is that the new

⁸ Such as situated learning, distributed cognition, activity theory and cultural historical psychology.

users are not necessarily acquainted with the knowledge that is built into the artefacts. The computer, for example, is a manifestation of more knowledge than any individual could produce in a lifetime. It is not necessary for the user to know about how the computer works, only how to operate it. Yet, the knowledge behind the computer is not maintained by end-users, other than by a range of specialists, who can only account for it together. The user, however, can take advantage of the built-in knowledge, and can accomplish things together with the computer that would not have been possible without it. In this manner, artefacts contribute to a cultural accumulation of knowledge.

An illustration of how people's lives are embedded in the sociocultural is that most of the objects we have in our surround today are precisely artefacts, not natural objects in the original meaning. Artefacts thus change our relation to the environment (Säljö, 2002). The use of artefacts in our culture also changes what people need to know, thereby learning changes. In this sense we are a product of the sociocultural.

Our interdependence with the sociocultural has now been illustrated historically, by showing how interaction contributes to the generation of artefacts and to social and individual knowledge. Moving on from the historical perspective, a small-scale perspective will be presented to show the sociocultural mechanisms on the individual level.

Lev Vygotsky was an early contributor to sociocultural theory from the Russian school of cultural historical psychology. He suggested that a child's development is not simply determined by biological factors on the individual level, the development of higher psychological functions is initiated within the framework of sociocultural conditions on the collective level:

Any function in the child's cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition... it goes without saying that internalization transforms the process itself and changes its structure and functions. Social relations or relations among people genetically underlie all higher functions and their relationships. (Vygotsky, 1981, p. 163)

Here, Vygotsky tries to bridge the individual and the collective. He focuses on the transformations between the planes rather than on their exclusiveness. Wertsch (1998) warns that Vygotsky's connection of the interpsychological and the intrapsychological, should not be interpreted within a static model of knowledge, where social processes are directly transferred from the external interpsychological plane to the intrapsychological plane. Rather, the internalisation is transforming the inter- and intrapsychological processes themselves and changes their structure and functions. Both the individual and the social plane is formative of the other through interaction. The

inseparability of the two planes has analytical consequences. Dillenbourg (1999) points out that in the study of collaborative learning internalisation is considered more of a process than an effect. Research traditions concerned with the individual would typically try to measure knowledge effects in people's heads. Within the sociocultural tradition, however, internalisation processes are objects of attention.

The internalisation process can be seen as a process of learning, or meaning-making. Vygotsky addressed the query as to how students learn, by asking how do students construct meaning (Jaramillo, 1996). Theories of learning that focus on the individual do not necessarily see learning as engagement in a social meaning-making process. Learning is seen as meaning-making internally in someone's head aided by transmission of meaning from head to head in the external. In the sociocultural perspective, however, the meaning-making process is shaped by, and unfolds in, the intersubjective world. Stahl (2003) notes about meaning-making that:

When we say that in Vygotsky's theory meaning is externalized, we do not imply that some kind of meaning first existed in someone's head and that it was then expressed, represented or otherwise made to take on a physical existence. To the contrary, the meaning fundamentally emerges in the external, observable, intersubjective world of other people and physical objects ...the external meaning can secondarily be internalized. In later developments, internalized meanings can be (re-)externalized. (p. 527)

Meaning is gleaned from ongoing experience. It is something that *emerges*, thus the word meaning-making. In this manner, learning can be viewed as an aspect of all activity (Lave, 1988), implying learning never stops. When people always learn, we must determine in what kind of learning we are interested. Our perspectives on learning matter. Wenger (1998) notes that what we think about learning influences where we recognize learning. From a sociocultural perspective the question about how we learn is a question about how we appropriate the resources for thinking and activities that exist in the culture.

One way of looking at learning is related to the needs of the society. The commonsense view of learning is not that people always learn. The perception of learning often has a normative flavour, this is seen in for example school curricula. One is specifying what should be learned. Research traditions focusing on the individual can thus look at learning as content and skills that can be acquired. In assessing learning, they try to measure if students have acquired it successfully. A problem, however, is that the researchers have a predetermined the contextual meaning that students should attribute their learning. Säljö and Wyndhamn (1993) show that a maths assignment was solved in different ways when it was introduced in maths class or social science class. The view of what is to be learnt varies in different contexts (Lave, 1988; Lave & Wenger,

1991). Thus, it is hard to isolate what students learn, since learning does not happen in isolation. Even if students do not learn what was intended, they always learn something.

A solution to this problem is to study the relevance participants themselves assign to their activities. How they in Garfinkel's (1987) terms *do* learning, and *do* recognise learning as having occurred. In this manner, the meaning that students attribute their learning is analysed in relation to the context in which they learn. The way to do this is by microanalysis of activities students engage in. It is here collaborative meaning-making unfolds. Researchers can make learning visible by interpreting these meanings and practices (Stahl, 2003). Koschmann (1996) states that research within CSCL takes on a participant perspective by focusing on participants' talk, the artefacts that support and are produced by a team of learners, and the participants' own accounts of their work.

Language is a key interest in the analysis of meaning-making and learning (Cole, 1996; Dillenbourg, 1999; Vygotsky, 1962; Wertsch, 1998). Talk is central in meaning-making as a '*social mode of thinking*' (Mercer, 1995, p. 4). Luria (1981) explains what language does for human beings:

The enormous advantage is that their world doubles. In the absence of words, human beings would have to deal only with those things which they could perceive and manipulate directly. With the help of language, they can deal with things that they have not perceived even indirectly and with things which were part of the experience of earlier generations. Thus, the word adds another dimension to the world of humans... Animals have only one world, the world of objects and situations. Humans have a double world. (p. 35)

Language operates as something that comes *between* humans and the world of objects and situations. Humans are liberated from only knowing the *immediate* situation; language can *mediate* objects and situations that fellow humans have experienced. This concept of mediation is central in sociocultural theory. Vygotsky's analysed means that enables, or *mediates*, interaction. The concept of mediation does not only apply to language. Although Vygotsky primary research interest was in the mediating role of language, he identified other tools for mediation, as well. By extending Engels's notion of instrumental mediation, he made a distinction between 'psychological tools' and 'technical tools' of production (Vygotsky & Cole, 1978; Wertsch, 1985). A parallel distinction has later been made by Säljö (2001) between material and immaterial (or intellectual) tools. Both material and intellectual tools are alike in that they mediate knowledge of the world. For example through language people can share ideas, and through the use of material tools people demonstrate knowledge to each other.

However, Wertsch (1998) argues that the distinction between the material and immaterial tools is simply analytical and thus, that the two categories can merge into one. He argues that 'materiality is a property of any mediational means' (p. 31). Even 'psychological' tools must at some point in

time be instantiated in the material world apart from the individual. The physical manifestation can take many forms. For example oral language, which is a seemingly immaterial tool, is manifest in the material by the sound waves carrying it. Wertsch points out that without such materiality, there would be nothing to act with or react to, and the culture could not share the tool. When tools are incorporated in our actions, they also gain mental properties. One can thus talk of the degree to which a tool is material or mental, according to the specific situation.

Now two accounts have been presented, explaining how people's lives are embedded in the sociocultural. First, a broad, historical perspective was presented, and secondly a small-scale perspective concentrating on the individual's relation to the sociocultural. The concept of interaction had a central place in each account. The concept of mediation was not articulated until in the latter account. Nevertheless, the first account had the idea of mediation present in how the role of artefacts was presented.

ICT is important in school reform, and the sociocultural perspective on learning is one of several perspectives that have been used to understand and promote the use of ICT in education (Hoel & Ludvigsen, 2002). Some forces see ICT as a tool for revolutionising schools (e.g. Papert, 1980). Without commenting this, it is noteworthy that within sociocultural theory, ICT is not seen as a separate class of tools, because the concept of mediation applies to ICT, as well. Nevertheless, ICT brings new opportunities. As an increasing part of education, it is important to understand how ICT is part of and shapes activities in education.

Computer technology is flexible, and illustrates well the relationship between immaterial and material tools. Software programs are intellectual constructs and immaterial, but take on a material quality through the 'user interface'. Examples of devices that function as user interface are the mouse, the keyboard, loudspeakers and the screen, with its graphical representations. Graphical representations on screen are volatile, and are not readily thought of as material. However, computers can make these graphical representations permanent for example by printing them on paper.

The variety and complexity of ICT show how knowledge is built into artefacts. The 'I' in ICT indicates that the technology contains information as residuals of various practices. ICT is also used as tools not only for accessing, but also for manipulating information. Software programs are developed, and come in new versions. The 'C' in ICT stands for communication. Communication technology mediates interaction between people. Examples are telephones, video conferences, e-mail and chat. Thus, the opportunities and characteristics of the technology, contribute to organising social activity.

From the very beginning of the development of ICT there has been an interest in applying such technology in education. Various pedagogical software applications have been tried out. The current study is positioned in the CSCL research field. CSCL utilises a sociocultural perspective

on the study of instructional technology. From a CSCL perspective, Koschmann (1996) states that it is not enough to focus exclusively on descriptive aspects of the application. Rather one must look at the actual use and at how the software is part of a learning situation. For this reason, there will be no attempt here to classify various pedagogical software.

The discussion of the individual, the social, interaction and mediational means, has explained understandings of, and connections between, these concepts. To illustrate how close the intertwining of the concepts is, one could look at Brown et al. (1993) who regard interaction with people as a type of interaction with cultural artefacts: 'Ways of knowing are deeply connected to the cultural artifacts of situations, artifacts that include tools and people' (Brown et al., 1993, p. 188). Not all researchers would adhere to such a broad definition of an artefact. However, when people are comprised in a definition of artefacts, it illustrates the close connection between notions such as people and tools. According to the situation people can be tools for each other. This text approaches the human–technology link by considering humans as actors, but maintaining that people's actions are persistently achieved by the use of tools. The division between the people and tools remains. However, the term *resources* will be used as a collective term, denoting what people or institutions use, refer to or otherwise make relevant through their interaction. A theoretical classification of different types of resources for interaction by Linell (1998) will be given in the last subsection of this chapter.

To recapitulate, the opening note from Säljö stated that knowledge first lives on the social plane, in the interaction between people. To study how knowledge is created, it becomes important to study the workings of interaction in the small; it was a microview Vygotsky employed, when studying how we learn in a given social situation (Jaramillo, 1996). After that, several people have been occupied with microstudy of social situations. Goffman (1983), for example, called it the study of the interaction order. Garfinkel (1987) has in his approach pinpointed a property of the interaction order; that people make their activities rational to one another. The concept of rationality will be described to provide a vocabulary for how agency looks in interaction.

4.2 Rationalities

A perspective that has contributed to sociocultural theory is ethnomethodology. The term ethnomethodology is coined by sociologist Harold Garfinkel. It terms the analysis of 'everyday activities as members' methods for making those same activities visibly-rational-and-reportable-for-all-practical-purposes, i.e. 'accountable,' as organizations of commonplace everyday activities' (Garfinkel, 1987, p. vii).

Garfinkel found, through his readings and studies, that people make their activities rational to one another. Following on Schutz (1953), Garfinkel illustrated different ways people can act rational, or, different 'rationalities' that people may follow. However, although he demonstrated these

different ‘models’ of rationalities, he refused to treat them as formal models, contending that the proper study of rationalities is not in theory, but rather *in action*. Although rationalities have been theorised on by the scientific community, Garfinkel demonstrates how scientific rationalities (rationality with a theoretic definition) are unfit as models for explaining people’s everyday activities. Concepts like *unrational* and *irrational* stem from a ‘scientific’ and predetermined view of rationality; so instead of asking whether different social instances are rational *per se*, Garfinkel suggests that one should look for *the ways in which* they are rational. Unlike theory-oriented science, which may explicate the rational of concepts for its own sake, people in everyday situations display the rational of their actions for practical purposes, and the rationality must be studied as a practical accomplishment:

[R]ational features *consist* of what members do with, what they ‘make of’ the accounts in the socially organized actual occasions of their use. Members’ accounts are reflexively and essentially tied for their rational features to the socially organized occasions of their use for they are *features* of the socially organized occasions of their use. That tie establishes the central topic of our studies: the rational accountability of practical actions as an ongoing, practical accomplishment. (Garfinkel, 1987, pp. 3–4, emphases in original)

The rational accountability is something people *do*, and is therefore available for study. Even so, the study of rationalities is not unproblematic. In interaction analytic terms people use various *resources* to make activities rational to one another. Such resources can for example be common experiences in a group, and may therefore be unavailable to non-members of the group, for example the researcher. Therefore, any statement of people’s rationalities in various situations must be made with caution, and has value in so far as it is made *accountable*.

The ethnomethodological view of rationality, or agency, goes well with founding theories of the sociocultural perspective. As quoted earlier, Vygotsky (1981) holds volition to be socially developed, it first appears between people as an interpsychological category. Agency unfolds in human interaction, and is bound to the affordances and constraints of the situation. In the terms of Lave (1993) human agency is ‘partially determined, partially determining’, thereby it also creates new affordances in interaction. For this reason, ‘action-in-context cannot be fully captured by any preconceived cognitive schema’ (Mantovani, 1996, p. 29). Hence, the proper study of rationality is in unfolding interaction.

The previous has given a brief account for how agency can look in micro-level interaction. Following up the earlier explanation of resources in interaction, the next subsection will elaborate on the role of resources in micro-level interaction.

4.3 Interactional Resources

Earlier, a wide definition of resources was proposed. The following will look at different types of resources in interaction. When we previously talked about interaction, face-to-face communication and language in particular was identified as central. However, the talk of interaction also included *inter-action* on a more general level.

Lave and Wenger (1991) have contributed with a specific perspective on learning within sociocultural theory. From this perspective people learn by entering various communities of practice. In the beginning people can gain a status of legitimate peripheral participants in a community of practice. Then, through increasing participation and involvement people learn to become full members. Learning involves the development of identities through practising different forms of membership. In a learning trajectory, interaction with other participants is important, as well as with artefacts. Opportunities and constraints for learning are given by 'structuring resources'. Lave and Wenger define structuring resources as the structuring effects of activities in social practices on learning processes, that is, how activities in a situation come together, shape each other and generate qualitative differences among specific activities going on.

As a person becomes more acquainted with a community of practice, he or she can better understand what is going on there and what there is to be learnt. Experience from prior activities is used as a resource in identifying the meaning and requirements of current activities. The learning involves an increasing discernment and mastery of activities, artefacts and discourses characteristic of community practices.

Knowledge within a community of practice is encoded in artefacts in ways that can be more or less revealing. Lave and Wenger use the term transparency for the cultural organization of access to this encoded knowledge: 'the term transparency when used here in connection with technology refers to the way in which using artifacts and understanding their significance interact to become one learning process' (p. 102). Technology thus becomes a resource and an aim for learning.

By shifting the attention from learning as something that happens in individuals' heads, to social participation, Lave and Wenger present a situated perspective. They imply that understanding and experience should not be seen in isolation, but are mutually constituting, and in constant interaction. They state that: 'Participation is always based on situated negotiation and renegotiation of meaning in the world' (p. 51).

The understanding that people are *situated* has been further developed within sociocultural theory during the 1990s. In addition to Lave and Wenger's (1991) perspective of situated learning, perspectives like situated action (Suchman, 1987) and a renewed interest in ethnomethodology have contributed to this. Stahl (2003) explains the term situated in this manner: '...human activity

– including contemplative thought – has its origins in our life-long involvement in a social and physical world that we share with other people and that is imbued with cultural meaning’ (p. 529).

That we are situated refers to our general relation to the environment. Following, the *situation* denotes where we find ourselves at a given point in time, that is, what is relevant here and now. As Dewey (1991) points out, without the situation one cannot make judgments about relevancies.

What is designated by the word ‘situation’ is *not* a single object or event or set of objects and events. For we never experience nor form judgments about objects or events in isolation, but only in connection with a contextual whole. The latter is what is called a *situation*. (p. 72)

The situation is a contextual whole within which we ‘form judgments about objects or events’. From the situation, people choose which contexts to evoke. This is visible in interaction in that ‘the parties, singly and together, select and display in their conduct which of the indefinitely many aspects of context they are making relevant, or are invoking, for the immediate moment’ (Schegloff, 1987, p. 219).

Thus, there are interactional resources, but as the situation is a contextual whole, it is not easy to talk of different *types* of contextual resources. Nonetheless, for analytical purposes it makes sense to do so. The following perspective of Linell (1998) has a linguistic approach. However, he does not only apply his concepts to talk. His description of contextual resources can be applied to an analysis of interaction with interests beyond linguistics.

Linell talks of *contextual resources*, ‘potential contexts that can be made into actual, relevant contexts through the activities of the interlocutors in dialogue’ (p. 128). He outlines three major dimensions of contextual resources; co-textual (or discursive) resources, situational resources and background assumption resources. The dimensions shade into each other, so the distinction is not meant to cement a fixed hierarchy of resources. The following three paragraphs explain the three dimensions.

Co-textual resources are the prior (up to the simultaneously occurring) discourse in an encounter. This ‘contextual resource comprises the whole interactional co(n)text, covering the sequence of relevant actions prior to the utterance (or action) in focus; in some cases, this sequence may contain primarily, or even exclusively, non-verbal actions’ (p. 128). This includes ‘body language’. Jordan and Henderson (1995) point out that all contributions to the interaction are both context dependent as well as context renewing.

Situational resources are the ‘immediate perceptual environment (“here-and-now”) with its physical spaces, persons (and their physical positions, e.g. seating arrangements), objects, artefacts (including immediate such as papers, computers and other carriers of linguistic, and other, signals)’ (Linell, 1998, p. 128).

Background assumption resources are also called mediate or abstract resources, because they are not directly and publicly manifest in the perceptually available situation and behaviours. The contextual dimensions that Linell classify as background assumption resources span from what the actors know about the things talked about in the discourse in question to broader cultural environments, like for example institutions. Among the resources is what he calls the 'abstract situation definition', or the 'frame'. The type of activity, the situated activity system and the communicative genre can all function as a frame: 'The frame defines "what it is that's going on" in a situation, and it sets up an expectation structure among actors' (p. 130). Linell notes that 'often the purposes of activities appear to be more consequential than the medium, speech or writing, itself' (p. 134). Therefore, he claims that if any, the context type describing frames, activity types and communicative genres may be assigned a higher status, since they often circumscribe what aspects of other contextual dimensions are likely to become relevant.

Extending Bateson's use of the term 'frame', Goffman (1974) defines a 'frame' as a principle of organization that defines a situation. Frames are not only something that people define themselves, but are something that they arrive at. Knowledge about common situational frames thus becomes a resource in interaction. Likewise, knowledge about *others' knowledge about situational frames* becomes a (complicating) resource. Goffman argues that situations have a multidimensional and layered nature, so it is insufficient to speak of *the* definition of the situation. Each participant in interaction can be in several complex layers of situational definition at the same time, and may not wish to attain a mutual definition of the situation. Each of the parties can purport a different meaning of the situation than they personally hold. A danger with ethnomethodological analysis is that it can fail to notice such mis-framing by being too commonsensical. Thus, awareness of Goffman's frame analysis theory can help deepen the analysis.

In the previous, sociocultural theory have been discussed, with attention to the chief role of interaction. A wide definition of resources has been put forward, to account for how various aspects of interaction can be used, or referred to, or otherwise made relevant by those who interact.

It is reason to believe that the outlined theoretical perspective allows a fair measure of how the constructivist pedagogy of S-vev is realised in praxis. Jaramillo (1996) states that although Vygotsky's sociocultural theory predates the constructivist movement, his theoretical framework contributed immensely to the development of this approach.

5. RESEARCH AIMS AND DESIGN

The two areas that were earlier suggested as focal points were the pedagogical design of the Explore Data assignments and actual student activity with the assignments. In general, the findings of a study depend on what is identified as data, how the data is gathered, and in turn analysed. The theoretical stance makes some aspects of reality salient, and thus influences what is identified as data. A *methodology* is a strategy for gathering and analysing data according to a theoretical stance. Methodology and theoretical stance must be commensurable. The selected methodology must be able to follow up the research task identified by the theoretical stance.

In this study the theoretical stance is sociocultural, which according to Wertsch (1998) implies the following research task: ‘The task of a sociocultural approach is to explicate the relationships between human action, on the one hand, and the cultural, institutional, and historical contexts in which this action occurs, on the other’ (p. 24). A general methodology concerned with this task is ethnography:

One’s goal as an ethnographer is to focus on a setting and, in Wolcott’s words to discover what is going on there. ...one is assuming that, to understand why things take place as they do, one must look at the relationship between the setting and its context – for instance, between the classroom and the school as a whole, the community, the community of the teacher, the economy, and so on. A judgement of relevant context must always be made, and the character of this context must be explored to the extent that resources allow. (Wilcox, 1982, p. 458)

The pedagogical design of the Explore Data assignments is made in the setting of the producer, and is ‘realised’ in the setting of students. A relevant query is how related these two settings are? For the purpose of analysis, are students and NSD essentially part of the same setting?

Of course, NSD crafted S-vev in preparation for the students’ setting. NSD has prior experience with students’ use of similar learning resources, gained for example in the ‘From Chaos to Knowledge’ project. However, the pedagogical solutions in S-vev were not tested by students during development. Moreover, NSD was not directly accountable to students during or after development. The students’ setting was therefore only an indirect context to NSD during the pedagogical design of S-vev. When studying the pedagogical design of the Explore Data assignments and actual student activity with the assignments, it is therefore natural to consider two settings. First, the setting of NSD, where the Explore Data assignments were pedagogically designed, and secondly, the setting of the students, where the Explore Data assignments are used.

Ethnography can serve as a general methodology in studying the two settings. Ethnography was developed as a methodology within the discipline of anthropology (Wilcox, 1982). Here, it was traditionally used as a way of describing the entire way of life of novel cultures, with a concern for the native view of reality. Later, ethnography has been applied on smaller and more familiar cultural settings, and kept a concern for the view of participants.

Each of the two settings is interesting in its own right. The relation to the authorities is relevant to NSD in its setting. An interest for the authorities through the ITU evaluation project would be whether the pedagogy NSD stated for S-vev was reflected in the pedagogical design of S-vev. In the Plan for Digital Learning Resources 2001–2003 the National Board of Education called for creative pedagogical solutions in the digital learning resources. I suggested earlier that the Explore Data assignments have a special role in relation to the visions for S-vev, and that these assignments would be promising in a quest for ‘creative pedagogical solutions’. This, however, must be further assessed. By extension, several questions arise in the NSD setting: What is NSD’s stated pedagogy? How does the stated pedagogy relate to pedagogical theory? New questions become relevant after the production of S-vev and the Explore Data assignments: How do the resources in the Explore Data assignments look? How can the design be theorised about pedagogically? Following from this, is the stated pedagogy implemented in the design of the Explore Data assignments?

The setting of the students is also interesting in its own right. Similar settings are often subject to CSCL research. The question in such settings is often how the interaction between the participants and between participants and artefacts looks. In particular, one studies how ICT supports the collaborative learning. That is, how characteristics of the situation and the ICT are consequential in the interaction.

Although the settings of the producer and the students are interesting in their own right, the relation between them can take the analysis to a higher level. The larger picture is that the education system is repetitively subject to reform, and ICT is thought to be a means and a motivation in this process (Hoel & Ludvigsen, 2002). School authorities have a designation of improving school pedagogy, thereby the call from the National Board of Education for creative pedagogical solutions. In this climate, the producer has stated a perspective of how students’ activity with their product will and should look. An interesting question, then, is what happens when the producer perspective meets praxis? S-vev was born by a pedagogical vision of NSD, and in the end, students who use S-vev can potentially ‘realise’ this vision in praxis. Gadotti (1996) makes clear that: ‘All pedagogy refers to practice and intends to be put into practice. It makes no sense without practice, as it is the science of education’ (p. 7). It is common in CSCL to design learning environments, and evaluate these. The current study is not very different. However, the design of the digital learning resource was not done for research purposes.

An overarching question in the study will be the relation between the settings of the producer and the students. The bridge between these settings is mainly S-vev. The producer, in its setting, imprinted its perspective in the pedagogical design of S-vev. The students, in their setting, use S-vev as a resource in their work. Even if there is no simple translation of the producer perspective into praxis, some distinguishable issues can be expected to arise in the meeting of the two settings through S-vev. One may ask what S-vev is in the setting of the producer, and what becomes of S-vev when used in praxis. More precisely, the producer has a perspective on which kind of activity S-vev supports, and provided resources accordingly. The question is, then, how does this relate to praxis; do the students employ the producer's resources in the Explore Data assignments, and do they use them as the producer had envisioned? Such a comparison will in turn indicate whether the pedagogical design of S-vev advances what the National Board of Education calls 'creative pedagogical solutions'.

First the setting of the producer will be studied, and next, the setting of the students. Phase I of the study is called 'The Producer Perspective', and Phase II is labelled 'Praxis'. There is an intention behind labelling Phase II praxis instead of practice. The common word pair, theory and practice, may give the impression that practice develops out of theory. Following these lines, a potential design of the study could be a simple validation of the producer perspective by 'trying it out in practice'. This is not the intention, however. The school, with its teachers and students, constitute their own setting. One cannot reset this setting to 'point zero' to realise a pedagogical idea. To avoid a view of practice as a mere representation of theory, the word praxis is preferred. Praxis is a dialectical concept, where the relationships between theory and practice blends (Gadotti, 1996). Praxis in Greek literally means action. As such it is social, situation bound, ongoing and transformative (Lave & Wenger, 1991; Smith, 1996). In accord with sociocultural theory, which characteristics in the Explore Data assignments students identify as resources first appear in the students' actual work with S-vev. Therefore, the setting of the producer and students will be studied on their own terms. Association of the producer perspective and praxis will not be done before the two phases of study have been conducted.

A concern is that it may be hard to observe 'creative pedagogical solutions' in action, since the infrastructure for ICT in education is not in place in many schools. This involves such things as computer equipment, internet connection and teacher and student computer competencies. As the authors of a British report (Cox et al., 2003) point out: 'Naturalistic studies – that is, those studies that investigate how teachers use their existing ICT resources – are often only able to focus on a limited range of uses' (p. 34). Westrum Hvammen (2003) had an initial aim of reflecting the variations of the different S-vev uses in her study. She found that limited computer skills and slow system response hampered the work. Because of such frequent problems, criteria will be made for selecting participants. Miles and Huberman (2002) argue for the possibility not only to study *what is* and but also to explore visions of *what could be*. The way of doing this is to locate ideal sites to

see what is actually going on there. Such selection is not based on criteria such as typicality or heterogeneity. Rather it is based on information about the *conditions* obtaining there.

As a start of the selection criteria, the schools should have adequate computer equipment and internet connection. The teachers should have some experience with S-vev, and have an understanding of NSD's pedagogical goal with S-vev. The students should be computer savvy enough to operate S-vev. When using these criteria, the resulting cases will more likely be ones that offer an 'opportunity to learn' (Stake, 2000). Even if the selection does not seek for typicality, the study is still naturalistic in that it studies actual student activity. The study of praxis does not intend to give an average picture of the situation in Norwegian schools. Rather, it can possibly give a picture of what the work with S-vev can look like under adequate conditions.

To be able to study students' work with S-vev closely, only a few students will participate. In the specification of design, NSD (2001c) says S-vev will encourage collaboration between students. This makes it natural to look at student groups. As a benefit it will be easier to tell how students make sense of their work, since there is more communication when students collaborate. The resources for study are limited, thus only two student groups will be analysed. However, to broaden the view of how the interaction with S-vev can look the groups will reside in two different schools.

Selecting two schools gives the opportunity to provide for some controlled variation between the school settings. As noted during the description of the theoretical perspective, prior experience can influence current interactions. Consequently, it may be an idea to select a school with students that have experience with S-vev, and another where students have no experience. This can give indications whether some ways of working with S-vev can be attributed to experience.

Stake (1995) notes about case study research in general that the primary goal is not to understand other cases, the first obligation is to understand the selected cases. Thus, the intention behind selecting the work of a few students for the current study is not to generalise the findings to a larger population of students. Rather, the intention is to explore possibilities in the work. Peräkylä (1997) notes that social practices that are possible, are the central objects of case studies on interaction in particular institutional settings. Further, 'the possibility of various practices can be considered generalizable even if the practices are not actualized in similar ways across different settings' (p. 215). Even if the actual conducts of the participants cannot be generalised, the possibility of such conducts can. The similarities across different setting are decisive for the extent to which the documented possibilities can be generalised.

Possibilities relate to the circumstances of the work, but are not automatically realised by the circumstances. Some affordances in the situation are persistent across settings. For illustration, there is an assumption within the current methodology that some exigencies regulate social discourse: 'Some...approaches to language use begin with an assumption or claim that certain

components of social discourse are inherent in communicative practice. Those components – practices, principles, exigencies – are presumably (or observably) universal.’ (Fitch, 1994, pp. 66-67) S-vev is also a persistent part of the context with a specific functionality. A point in case is that when some things are static, variations in interaction can come forth. Hence, possibilities outlived by the cases are not merely incidental, they can give understanding of the characteristics that arise in the meeting between students and S-vev. When exploring possibilities of interaction, a focus is to discern in what ways S-vev is consequential for the interaction. This can be done by examining how the things said and done bring forward S-vev as a tool and a context. When selecting particular strips of student interaction for analysis, it is important to select strips where S-vev seems to have been highly consequential in the interaction. In this way one may learn the most about S-vev.

With a sociocultural theoretical stance and an ethnographic methodology, some research questions become more natural to ask. Studies within this framework tend to look at the specific instead of the general. Resources are studied for how they become salient in a specific setting:

Rather than arguing for or against the merits of using information technology in contexts of learning at a general level, it would seem appropriate to inquire more precisely into what features of such resources are likely to have an impact on learning in the diverse range of settings in which people appropriate knowledge and skills (Säljö, 1999).

Because of the uniqueness of the setting in which people appropriate knowledge and skills, research questions tend to be open, instead of bringing in generalised assumptions. This makes sense in the current case, where there are only few previous studies.

5.1 Research Questions

The previous discussions have developed the focal points suggested at the outset of the study. An overarching interest is what happens when the producer perspective meets praxis. The producer has a perspective on which kind of activity S-vev supports, and have provided resources accordingly. The students as a matter of course uses resources from the Explore Data assignments in their interaction. However, it is not given that students identify the same characteristics of the assignments as resources as the producer does. Nor that they are used as the producer had envisioned. Before comparing the producer perspective with praxis, the settings of the producer and the students must be studied in their own right. This will be done in two phases of study, each with a separate research question.

It was suggested that natural research questions within the theoretically and methodologically framework tend to be open. On that background, research questions for the two phases can be formulated. The research questions are as follows.

Phase I: *What is the pedagogical design of the Explore Data assignments; which activity does the producer envision this design to support, and what do the provided resources look like?*

Phase II: *What characterises the students' interaction during the work with the Explore Data assignments, and which resources are used in the interaction?*

Subsequently, in answering the research questions, it is necessary to choose techniques for gathering and analysing data. The previous has explained how data is identified in ethnography, namely by judgement of relevant contexts. Ethnography strives for an ideal of holism by pursuing relevant contexts to a setting as far as resources allow. The concern for the various contexts, independent of category, makes ethnography multi-method in its approach. It encourages the use of multiple research techniques, constantly drawing on relevant bodies of theory and knowledge to move the research process forward (Wilcox, 1982).

The choice of research techniques for the two phases of study is done within the sections for Phase I and Phase II. This also increases readability, since the presentation of techniques comes closer to the presentation of how they were applied.

Phase I: The Producer Perspective

Chapter 6 – Techniques and Data

Chapter 7 – Analysis of the Explore Data Assignments

6. TECHNIQUES AND DATA

6.1 Choice of Techniques for Gathering and Analysing Data

The Explore Data assignments consist of text. According to Silverman (2001), the approach of researchers to texts should be to ‘analyse how they work to achieve particular effects – to identify the elements used and the functions these play’ (p. 122). In accord with this, the analysis of the Explore Data assignments will identify elements of the text and how they function together to make up a task. This will be further analysed in light of the producer setting, to see the effects that NSD wants the assignments to achieve.

Content analysis

To start with what Silverman called ‘the elements’ of a text; an apparent characteristic of the Explore Data assignments is that they have similarities in structure, and have many reappearing formulations. This is in line with Atkinson and Coffey’s (1997) observation: ‘Certain document types constitute – to use a literary analogy – genres, with distinctive styles and conventions. They are, for instance, often marked by quite distinctive uses of linguistic registers.’ (pp. 48-49) An analytic tool for systematically reckoning the textual similarities is provided by content analysis. With content analysis content is coded with separate categories. The categories must be clearly described, so that other researchers can arrive at a similar or comparable coding result (Berg, 1998). According to Berg (1998), content analysis ‘is a passport to listening to the words of the text, and understanding better the perspective(s) of the producer of these words’ (p. 22). This is in line with the sociocultural and ethnographic concern for the context and origin of a resource. Consequently, the technique of content analysis can be used within an ethnographic methodology to shed light on the research question. One of the sub-questions in the research question concerns what the provided resources in the Explore Data assignments look like. By describing what the provided resources look like, one can additionally say something about the producer perspective.

A content analysis can be theoretically or empirically driven. An initial read-through of the Explore Data assignments shows many reappearing formulations. This allows for an empirically

driven analysis where the categories are developed during the work with the text, in a hermeneutical relationship to the cases actually included. Such analysis can give a grounded overview of elements in the text of the Explore Data assignments. It is no reason to believe, however, that clear-cut elements will simply ‘emanate from’ the empirical material. As Edwards and Lampert (1993) point out:

Empirically derived categories are not necessarily theory neutral, however. Once coding dimensions and categories have been sketched out, researchers must still define these explicitly and describe how they differ from one another, and in doing this, they create an outline for a how exemplars in a particular domain are to be viewed and classified. As a result, this outline forms its own implicit theory of how language is organized and how future data are to be coded. (p. 172)

As understood from Edwards and Lampert, even empirically driven content analysis happens in dialogue between empirical data and theory.

The content analysis is useful for identifying the elements of the Explore Data assignments. However, Silverman notes that qualitative research cannot be satisfied with a simple coding of data. One has to work to show how identified elements of a text are assembled or mutually laminated. Moreover, one has to move from the elements of the text to the ‘functions these play’ (Silverman, 2001, p. 122). Since the Explore Data assignments are assignments in a pedagogical setting, it is reasonable to assume that the different content elements have different pedagogical functions in the assignments. Therefore the content analysis will be concluded in a discussion on how the different assignment elements function together to make up a task.

Participant observation and document analysis

The third main purpose when analysing the Explore Data assignments is to analyse ‘how they work to achieve particular effects’ (Silverman, 2001, p. 122). In other words, what is analysed is the pedagogical design of the assignments. The analysis of the pedagogical design will draw on the content analysis and the task analysis. The analysis of the pedagogical design will have a broader horizon than the actual assignments. It will include the intentions of the producer; which student activity NSD envisions for S-vev and the Explore Data assignments. This means that relevant contexts for the design of S-vev must be pursued. It is neither possible to identify nor to study *all* the potential relevant contexts for this. However, a general macroethnographic understanding can be informed by a microethnographic strategy to ‘focus on ‘incisions’ at particular points in the life of the larger setting or institution’ (Berg, 1998, p. 122). In the selection of points for ‘incisions’, I draw on a general macroethnographic understanding. This includes a review of theory and research on ICT and pedagogy in school settings. My own participation during a year’s engagement at NSD will inform the course of analysis.

The engagement at NSD counts as participant observation, which is a basic technique for data gathering in ethnography. It is particularly compatible with the concern to have direct contact with the phenomenon being studied and the concern to avoid disrupting the processes being studied (Phillips, 1982). Participant observation is to participate and to observe what one participates in at the same time. To do this one must be able to see one's own participation from a distance:

The goal of ethnography is to combine the view of an insider with that of an outsider to describe a social setting. The resulting description is expected to be deeper and fuller than that of the ordinary outsider, and broader and less culture-bound than that of the ordinary insider. (Wilcox, 1982, p. 462)

At the time NSD sent the tender to make S-vev, I had already attended a course for my Research Master, and looked at S-vev as a potential research case. This made me look differently at my participation, and made me pay attention to NSD's pedagogical considerations before, during and after the production. By attending both to the research setting and the NSD setting, I was able to have an outsider and an insider view at NSD. From the early spring 2002 I did not renew my engagement with NSD, and was at the same time included in the ITU evaluation project. This made me less culture-bound to NSD.

During the time at NSD, and through the evaluation project, I learnt that written documents play an important role in relation to S-vev. Some documents fill a unique function, such as the call for tenders, and the S-vev tender. The contract between NSD and the National Board of Education, for example, is legally binding. If S-vev is not designed in accordance with the specifications in the contract, the National Board of Education can sanction NSD economically. In this regard, S-vev plays a part in a larger setting than that of the school audience. Additionally, there are documents for the promotion of S-vev, and for explaining to teachers how S-vev can be used pedagogically. Documents constitute much of the relations between political institutions, NSD and the public.

Documents therefore serve as productive points for what Berg (1998) calls 'incisions' for analysis. Ethnographic fieldwork was historically conceived and developed for research in exclusively oral settings, not only in non-literate societies, often studied by social anthropologists, but in essentially oral cultures or subcultures in more advanced literate societies (Atkinson & Coffey, 1997). Atkinson and Coffey (1997) has therefore described how ethnographic research can take into account the central place of documents in some cultures. Their ethnographic methodology maintains the relation between documents and the sociocultural context. Atkinson and Coffey say about documents:

They are ‘social facts’, in that they are produced, shared and used in socially organized ways. ... They construct particular kinds of representations with their own conventions. ... We have to approach them for what they are and what they are trying to accomplish. (p. 47)

Document analysis (Atkinson & Coffey, 1997) will be applied in an attempt to see the bigger picture. We might see how the documents have influenced the design of S-vev, the pedagogy that has informed the design, and which pedagogical activity NSD envisions S-vev to support. The pedagogy in the documents will be held against the results from the content analysis and the task analyses, to see if the characteristics of the Explore Data assignments are in accordance with the pedagogy stated in documents.

In this phase of study it is necessary to bear in mind that the pedagogy of the Explore Data assignments is not realised before in Phase II, where the Explore Data assignments can be observed as a resource in actual student work.

6.2 Description of Analytic Techniques

This latter half of the chapter presents the techniques used during the analysis, when the data was ordered, analysed and interpreted.

6.2.1 Content analysis

Although most persistently exploited in mass communication research (Riffe, 1998), content analysis is employed in a number of disciplines with multiple definitions (Shapiro & Markoff, 1997). A definition of content analysis suitable for this study is one of Irving L. Janis:

‘Content analysis’ may be defined as referring to any technique a) *for the classification of the sign-vehicles*, b) which relies solely upon the *judgements* (which, theoretically, may range from perceptual discrimination to sheer guesses) of an analyst or group of analysts as to which sign-vehicles fall into which categories, c) on the basis of *explicitly formulated rules*, provided that the analyst’s judgements are regarded as the reports of the scientific observer (Janis, 1949 in Shapiro & Markoff, 1997, p. 9)

In relation to this study, the sign-vehicles are formulations, and the analytic product is description through classification. In accordance with the definition, rules for classifying the formulations will be developed and explicated.

In contrast to many definitions, this definition allows for an empirically driven approach. This means that the category boundaries can be latent during the coding, and have a hermeneutical relation to the formulations. However, such an approach can only be taken since the analysed text

is not a sample of a larger text population. Had the text been a sample, the categories and the conclusions would be likely to reflect peculiarities of the sample rather than characteristics representative on the larger text population. However, because the text is complete, it is exactly the peculiarities and characteristics that are valuable to the analysis, since the aim of the analysis is description of the content of the Explore Data assignments. An empirically driven approach allows categories to be grounded, instead of forcing a predefined pattern upon the text.

The unit of analysis in the content analysis is formulations. In the process, a set of categories will be established along with the different recurrences in the text, and these will again be successively modified, before settling on the categories that best resonate with the text. By making multiple passes through the text, the categories can be accommodated until a point of fixation when a coding pass yields no changes. This procedure will ensure that the coding judgements are not being made in a qualitatively different manner at the beginning and end of the text. Describing the fixated category boundaries will thus itself be part of the description of the text.

6.2.2 Document analysis

When analysing documents it is important to have in mind what Atkinson and Coffey (1997) calls the overall system of production, exchange and consumption of documentary materials. Documents may fill a particular function in a larger setting, or alternatively they may try to claim a position. They must be analysed with attention to how authorship and readership (implied or actual) are projected. Knowledge of readers is important. As Watson (1997) points out, 'texts are often designed to engage with a specific set of presumed relevances amongst readers' (p. 89). Knowledge of authors is also important. As Atkinson and Coffey (1997) state, organisations often produce documents concerned with their self-presentation. Such documents can provide identity and self-understanding within the organisation. Besides, it 'may be among the methods whereby organizations publicize themselves, compete with others in the same market, justify themselves to clients, shareholders, boards of governors or employees' (Atkinson & Coffey, 1997, p. 46).

An important context of documents is other documents. The sheer amount of documents in some cultures, and their constitutive role in activities of which they are part, make Atkinson and Coffey (1997) even use the term 'documentary reality':

Documents do not stand alone. They do not construct systems or domains of documentary reality as individual, separate activities. Documents refer – however tangentially or at one remove – to other realities and domains. They also refer to *other* documents. This is especially, though not exclusively, true of organizational settings and their systems of record keeping. The analysis of documentary reality must, therefore, look beyond separate texts, and ask how they are related. (pp. 55-56)

When documents are contexts for each other, they must be analysed for how they explicitly or implicitly refer to each other. The role documents and texts have in interaction entitles Smith's (1982) notion of the *active* text. Watson (1997) explains this as: 'A text that has a structuring effect, that actively organizes a course of social action and that is consequential for that action, directing it in its course' (p. 85).

6.3 Data

The Explore Data assignments

The Explore Data assignments were data in the content analysis. In preparation of the content analysis, they were copied from the Plans of Work in S-vev and gathered in a single digital document.

Participant Observations

As outlined in the Research Aims chapter, participant observation is a technique for accessing data. Phillips (1982) states that participant observation is 'simultaneous occupation of a structural position within a social system and study of that system' (p. 201).

Personally, I had a year's engagement with NSD. I was an employee at the time the tender to make S-vev was sent, and during the production of S-vev. I participated in early meetings of the planning phase of S-vev. Even if my formal work instruction was technical, and not on the pedagogical design of S-vev, the participation in the production team gave access to some of the pedagogical considerations. In addition, I was an assistant on NSD's S-vev courses for teachers, and observed the pedagogy NSD purported for S-vev there. This participation will be used as a resource for understanding the larger ethnographic context, and subsequently the role of S-vev as an artefact in NSD's setting.

Some of the participation at NSD included work with preliminary texts, and sketches for the design of S-vev. The next section identifies a range of more formal documents.

Documents and texts

Berg (1998) notes that a microethnographic strategy is to focus on 'incisions' at particular points in the life of the larger setting or institution. Several documents stood out as valuable points of incision into the life of NSD and the larger setting.

Some of the documents collected were authored by NSD. These were documents concerned with NSD's self-presentation and the stated pedagogical platform, or documents relating to S-vev, including the presentation of S-vev. Additionally, documents related to the NSD devised project From Chaos to Knowledge were collected.

Official documents included were the curriculum, government plans and documents related to the digital learning resources in citizenship. More public texts were also judged relevant, such as press releases and press coverage on S-vev. See appendix for a full list of documents.

7. ANALYSIS OF THE EXPLORE DATA ASSIGNMENTS

The Explore Data assignments are first analysed⁹ with the technique content analysis, to determine what the resources in the assignments look like. The task that is conveyed in the assignments is then described with the technique task analysis. These analyses give a basis for a description of the pedagogical design of the Explore Data assignments. Finally, the pedagogical design is discussed in relation to the activity the producer envisions for students' work with Explore Data assignments. To analyse the producer's perspective, the technique document analysis is applied.

7.1 Content Analysis

The unit of analysis in the content classification began as recurring expressions and formulations¹⁰. However, the work with the classification also revealed different formulations that seemed to fill the same function. These were put together in a single category. What began as a category for a formulation ended up including formulations with similar function. Refer to the appendix for a complete record of the instances in each coding category.

Below is a brief description of what characterised the instances that ended up in each category. The presentation is arranged to reflect the typical category sequence found in assignments.

The 'expect' category

The instances of this category ask the students in a concrete way to make an expectation. Some common 'expect' formulations in the Explore Data assignments were:

- Formulate a hypothesis (claim about a relationship) that says something about...
- Formulate some thoughts about relations between...
- Do you believe it is...

The first example asks for a hypothesis. 'Hypothesis' is defined several times within the Explore Data assignments as 'expectation about a relationship'. The second example's formulation, 'thoughts about relationships', is very similar to this definition. The third example's formulation, 'Do you believe', appeared in different contexts, illustrated by:

⁹ Examples from the Explore Data assignments have been translated into English for the purpose of presentation. The Appendix contains the examples in Norwegian, sorted by the page they appear in this text.

¹⁰ The categorising has been limited to those assignments involving tabulations. Other types of assignments were so rare and diverse that it would only be confusing to include them in a general argument about the Explore Data assignments. Assignments that have been avoided are for example those using the statistical command "List data", assignments asking students to browse external pages, or assignments asking students to browse the "S-vev Database of Political Parties' Press Releases".

In which way *do you believe* religiousness is connected to view of gender roles? Make a cross-tabulation where you choose RELIGIOUSNESS as independent variable and GENDER ROLES as dependent variable. Was the relation as you thought?

Do you believe girls or boys bully the most? Make a cross-tabulation where you use BULLY OR NOT PERSONALLY as dependent variable and SEX as independent variable.

There were more than 35 instances categorised with the category 'expect'. This makes the category a very frequent occurrence in the text.

The 'generate' category

Instances of this category request statistical operations. Almost all assignments contain a 'generate' instance. The most frequent formulations for this were 'Make a cross-tabulation' or 'Use the variables...'. A characteristic of most 'generate' instances is that they specify precisely which variables should be analysed. The instances thus function as operational receipts, and do allow for real 'exploration' in the Explore Data assignments. The type of analysis is most often apparent, and often explicitly formulated; 'make a cross-tabulation' or 'make a frequency-distribution'. Below is an example of a typical 'generate' instance (italicised) in context:

In which way do you believe religiousness is connected to view of gender roles? *Make a cross-tabulation where you choose RELIGIOUSNESS as independent variable and GENDER ROLES as dependent variable.* Was the relation as you thought?

The 'examine' category

Instances of this category ask the students to examine a statistical outcome, either in general or for a specific feature. Illustrative instances are:

What does the table show?
How is the relation?
Look at the sum...

The 'verify' category

As seen with the 'expect' instances, students are often asked to make an expectation before they generate statistical tabulations. The 'verify' instances occur after the statistical operations and ask the students to verify their expectation. An italicised 'verify' instance is displayed in context:

You will now do the same as in assignment 1. Now you are going to formulate the hypothesis yourself, and you are going to use SEX WITH SAME SEX as dependent variable. How are the changes? *Is your hypothesis fitting?*

The question ‘Is your hypothesis fitting?’ asks the students to verify the expectation they were told to make with ‘Now you are going to formulate the hypothesis yourself’. Illustrative instances of the ‘verify’ category are:

Is the hypothesis verified, or is it disproved?

Was the relation as you thought?

Is your hypothesis fitting?

The ‘explain’ category

Instances of this category ask the students to explain what they see in the statistical outcome.

Illustrative instances are:

How will you explain this result?

How will you interpret the tables?

The ‘comment’ category

Instances of this category often occur together with instances of the categories ‘examine’, ‘explain’, and ‘verify’. It is very similar to the category ‘explain’. Both categories point to the statistical outcome, but while the ‘explain’ instances ask for an interpretation or an explanation, the ‘comment’ instances ask for a comment. Illustrative instances are:

Comment the result.

Comment what you read out of the tables or the figures.

Write a short comment to the table.

The ‘find out’ category

This category contains instances with the expression ‘find out’ (‘finn ut’ in Norwegian). With the find out instances, it is predetermined what the students should look for in the generated tabulations:

Find out whether boys and girls still have different opinions about the political parties.

Use the variables that measure whether one dislikes or likes the different parties as dependent variables together with SEX as independent variable.

Assignments containing ‘find out’ instances can be characterised as special cases, because they seldom contain instances of other categories than ‘generate’ and ‘examine’. ‘Find out’ instances are clearly instructive, and do not ask the students to make an expectation. A characteristic of the instances is that most of them appear in assignments with untypical ‘generate’ instances. In these cases, the students are less familiar with the requested statistical operations, and in turn this may explain the directive nature of the ‘find out’ sentences.

Uncategorised text

Not all sentences in the assignments are categorised. Most of these sentences are questions appearing in conjunction with the requests for statistical operation. One of these questions (italicised) appear in context below.

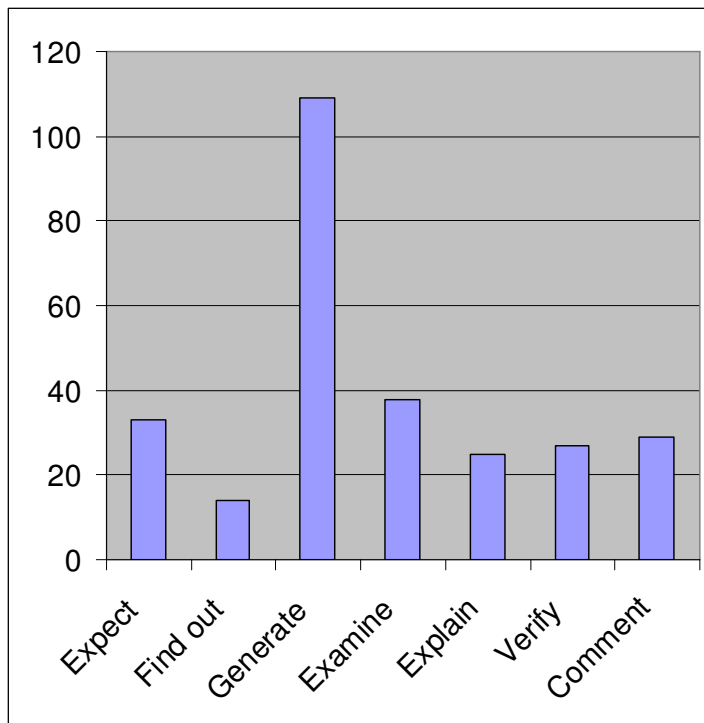
Will persons with homosexual friends be more positive to homosexuals as good caregivers for children? To study whether there is a relation you have to make a cross-tabulation between the variable LESBIAN PARENTS as dependent variable and the variable HOMOSEXUAL FRIENDS as independent variable. ...

The reason for not categorising this kind of questions was that even if the function in the assignments was similar, the questions did not have similarities in wording. To give an impression of the volume of instances not accounted for in the content analysis, the questions were counted to 48.

Sum up

The content of the Explore Data assignments is densely categorised. The density of the categorising and the limited number of categories show that the main ‘building blocks’ of the assignments are relatively few, and the instances within each separate category reveal clear similarities in the formulations.

Figure 6: Frequency-distribution of categorised instances



The figure shows that recurring formulations are very frequent in the assignments, with 275 categorised instances. The most frequent instances are of the ‘generate’ category, almost three times as frequent as instances from the second category ‘examine’. In the other end of the continuum, the ‘find out’ category has half as many instances as the next in rank, the ‘explain’ category.

As could be expected, instances of the ‘generate’ category are the ‘core’ of the assignments. After all, the assignments are entitled Explore Data, and this category prescribes operations for generating statistical data. The category can thus be described as a *resource for operation*. The collective term *resources for reflection* can be used for the other categories. An exception is the ‘find out’ category that only states something one should find out by making and reading a table, and can be considered a general contextualising resource. A resource not accounted for in the content analysis was a common type of questions also contextualising the statistical operation. These questions did not explicitly ask for reflection or operations.

The content analysis has identified and described a set of resources in the Explore Data assignments. Two main classes have been put forward, namely resources for reflection and resources for operation. The next two sections turn to what the resources of the two classes try to convey, and the nature of the task they outline.

7.1.1 The function of the content

The content analysis has identified common elements in the Explore Data assignments. However, Silverman (2001) argues that qualitative research cannot be satisfied with a simple coding of data. One has to move from the elements of the text to the ‘functions these play’ (Silverman, 2001, p. 122). The resources in the Explore Data assignments seem to serve two functions, to specify operations and promote reflection. The function of the resources for operations will be discussed before the function of the resources for reflection. Resources for operations were instances of the ‘generate’ category. The following examines the function of these instances by outlining the nature of the task that they specify.

Most of the ‘generate’ instances give instructions for generating cross-tabulations. Typically, the variables tabulation is specified. To do the tabulation one has to use the statistics engine NSDstat. If not apparent from the context, the instructions will say which survey is going to be used. A link to open the particular survey in the NSDstat environment is always available in the Explore Data section. The links are survey specific, which means that NSDstat will ‘load’ variables and their values specific to the particular survey. When the link is clicked, NSDstat is loaded. The default NSDstat interface contains only one variable list, which is suitable for making frequency-distributions. To do the more common cross-tabulation one has to click an ‘Add variable’ button.

The next step is selecting the variables specified in the assignment from the two variable lists. At this point, the Explore Data assignment is not visible, and one has to remember the variables. The following figure illustrates the selection of the variables.

Figure 7: Selecting variables for a cross-tabulation

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Avhengig variabel:
 INNVANDRINGSTRUSSEL: Innvandring utgjør en alvorlig trussel mot vår nasjonale egenart

Uavhengig variabel:
 FYLKE: Fylket som skolen ligger i

FYLKE: Fylket som skolen ligger i
 BOSETNINGSTETTHET, TYPOLOGI: Prosent av innbyggerne i tettbygde strøk
 KOMMUNETYPE-KOMBINERT:SSBs kombinerte klassifikasjon etter næring/sentralitet
 FLYTTTEBALANSE: Nettoflytting 1990-2000 i prosent av folketallet 1990
 ARBEIDSLLEDIGHET: arbeidsledige i prosent av arbeidsstyrken 2002
 FØDESTED UTENFOR NORDEN: Prosent av innbyggerne i kommunen som er født i et land utenfor Norden
 EU-1994: Prosent nei ved folkeavstemningen om EU i 1994 i skolekommunen
 STUDIERETNING: Hvilken studieretning går du på?
 FORENKLET STUDIERETNING: Hvilken studieretning går du på?
 FORELDRES UTDANNING: Hvilken utdanning er den høyeste?
 EGNE UTDANNINGSPLANER: Hvilken endelig utdanning tar du selv sikte på?
 KJØNN: Er du gutt eller jente?
 EGEN UTDANNING: Hvor mange år har du gått på videregående skole?
 POLITISK INTERESSE: Hvor interessert er du i politikk?
 TILLIT TIL POLITIKER: Hvor stor tillit har du til norske politikere?
 LOKALDEMOKRATIET: Fornøyd med den måten lokaldemokratiet virker?
 LOKALVALG: Hvor stor betydning får resultatet av lokalvalget?
 STEMMERETT/DELTAELSE: Har du stemmerett og vil du benytte denne?
 INFORMASJONSKILDE: Hva er din viktigste kilde til informasjon om politikk?
 EU: Synes du at Norge bør bli medlem av EU?

After the variables have been selected one can click the result button, to load the table:

Figure 8: Result of tabulation

s-vev.no VEL NYNORSK | LÆRERENS SIDER | OM S-VEV | SØK:

Samfunnslære NSDstat for web Dataressurser Egne undersøkelser Diskusjon

Datsett | Metode og statistikk | Hjelp

Du er her: NSDstat for web > Datsett > Datsett: I109 Skolevalgsundersøkelsen 2003

Datsett: I109 Skolevalgsundersøkelsen 2003

Dokumentasjon | Tabell | Grafikk | Nedlasting

INNVANDRINGSTRUSSEL: Innvandring utgjør en alvorlig trussel mot vår nasjonale egenart (Rekke)
 KJØNN: Er du gutt eller jente? (Kolonne)

	Gutt	Jente	Total
Helt enig	35,9	18,7	27,0
Nokså enig	13,2	14,2	13,7
Både og	20,2	24,0	22,1
Nokså uenig	11,7	17,1	14,5
Helt uenig	19,0	26,1	22,7
Total	100,0	100,0	100,0
N=	2184	2359	4543

Copyright: Kopirett(c) Norsk samfunnsvitenskapelig datatjeneste, Bergen 2003

Lagre tabell i tab format

Avhengig variabel:
 INNVANDRINGSTRUSSEL: Innvandring utgjør en alvorlig trussel mot vår nasjonale egenart

Uavhengig variabel:
 KJØNN: Er du gutt eller jente?

Fjern variabel Dokumentasjon Analysetype: Tabell Resultat

The Teacher's Pages on S-vev encourages that students should make a digital document to 'take notes and log the assignments they are working with' to 'preserve the knowledge'. In addition, Explore Data assignments in some Plans of Work suggest that the students copy the table, and paste it into a digital document. To go back to the presentation of the Explore Data assignments one can use the back button in web browser. The previous has shown what one, at the minimum, has to do to follow typical instructions for operating NSDstat for Web.

Operating NSDstat for Web is not all there is to an assignment. The resources for reflection can be expected to play a role, as well. It is an aim to understand which function NSD wants these to play in the students' work. Silverman notes that qualitative research cannot be satisfied with a simple coding of data. One has to work to show how identified elements of a text are assembled or mutually laminated. The following will look at how the different assignment elements function together to make up a task.

Listed below are the categories, arranged to reflect the relative sequence in which their instances appear in the assignments. Relative – because the instances in an individual assignment will not represent more than a few of the categories (only in one single case, instances of five categories appeared on a row). Also relative – because in some cases the order has minor variations, but the arrangement below reflects the main tendency. Selected instances from various assignments illustrate the categories to show how they are related.

'Expect':

Do you believe it is girls or boys that are bullied the most? Give grounds for why you think the way you do.

'Generate':

Make a cross-tabulation where you use GRADE as independent variable and BULLIED OR NOT as dependent variable.

'Examine':

How is the relation?

'Verify':

Do the results correspond with what you believed in advance?

'Explain':

How will you explain the relations?

'Comment':

Comment what you read out of the tables or the figures.

The category names themselves indicate what their instances are trying to convey. The names are selected words found in the actual instances.¹¹

When ‘expect’ instances are aligned with instances of other categories, like above, they seem to fill a function of preparing the work in the NSDstat for Web. ‘Expect’ instances ask the student for an initial expectation about an issue. Prompts to give grounds for the expectation may be there to increase initial reflection. The prompts to give grounds can also be interpreted as something that should be pursued by the following statistical work. After all, several ‘expect’ instances use the word hypothesis in their prompt for an expectation.

The issue is operationalised in the ‘generate’ instances, which state appropriate variables for looking into the issue. As shown above, the instructions in the ‘generate’ instances typically results in a table (unless one has selected another presentation format, like graphs or pie charts). The student is then asked to identify patterns in the statistical outcome. Instances of ‘examine’, ‘comment’ can function this way. ‘Verify’ instances ask whether the statistical outcome was as predicted by the student’s prediction or hypothesis. In conjunction with ‘verify’ instances, instances of ‘explain’ and ‘comment’ can serve to ask the student to reflect on how the statistical outcome related to what was expected.

The above delineation makes it clearer how instances of the various categories relate. The task outlined must be completed in a certain sequence, later parts of the task rely on that earlier parts are finished. In addition, it is clear that some categories are more distinct than others are. Observe that, due to its general nature, instances of the ‘comment’ category sometimes have a wording close to ‘examine’, directing the attention to the statistical outcome. Sometimes the wording is close to ‘explain’, asking for an opinion about a particular pattern in the statistical outcome. ‘Comment’ instances often occur alongside ‘examine’, ‘verify’ and ‘explain’ instances, and these can be seen as concretisations of the ‘comment’ category. Moreover, instances of the ‘examine’ category can be considered implicit in assignments where they do not occur. That is, to explain a table one must have examined it. The category instances that usually appear after the ‘generate’ instructions in an assignment fill some of the same function.

The most distinct categories are ‘expect’, ‘generate’. The other categories all direct attention to the statistical outcome. The ‘verify’ category, however, guides the attention according to the initial expectation. There are thus three main stages in the Explore Data assignments. First, the student is asked to make a prediction or hypothesis on an issue. The issue is then operationalised, and the student is instructed to generate a specific statistical outcome. Lastly, the student should interpret the statistical outcome, preferably in relation to the initial expectation.

¹¹ The ‘find out’ category is not included in the list because its instances often appear alone in the assignments, and not alongside other resources for reflection.

This is very similar to a model widely used in science education, namely predict–observe–explain (Harlen, 1992). This model has an equivalent in the scientific literature. Gunstone and White (1981) made the predict–observe–explain technique as a modification of the demonstrate–observe–explain strategy first designed by Champagne, Klopfer and Anderson (1980). Mthembu (2001) summarises the technique like this:

Predict–observe–explain (POE) is a teaching strategy that probes understanding by requiring students to carry out three tasks. First the students must predict the outcome of some event and must justify their prediction; then they describe what they see happen; and finally they must reconcile any conflict between prediction and observation. (Introduction section, para. 5)

The similarity to a model from science education seems sensible in relation to that S-vev is built on a pedagogy that NSD calls ‘the laboratory of social science’. Amundsen (2003) formulates the pedagogical platform of NSD that S-vev is built on:

The idea is to employ the students’ natural curiosity and inclination towards research, pedagogically grounded in what NSD calls ‘the laboratory of social science’ (NSD, 2000). NSD envisions that S-vev will function as a laboratory the way we recognise it from the natural sciences, but with social science data. (p. 51, my translation)

To recapitalise, the content analysis has identified a set of resources the Explore Data assignments provide. In the interpretation of the analysis, two main classes has been put forward, namely resources for operation and resources for reflection. The resources outlined a coherent task, which turned out to be very similar to an approach used in science education, namely predict–observe–explain (Harlen, 1992). The similarity makes sense in relation to NSD’s stated pedagogy ‘the laboratory of social science’.

7.2 Document Analysis

Silverman (2001) states that The analytic approach to texts should be to ‘analyse how they work to achieve particular effects – to identify the elements used and the functions these play’ (p. 122). Accordingly, the content analysis identified the elements used in the Explore Data assignments. The analysis was furthered by examining the functions of the elements in the assignments. The current section will follow up by examining what NSD tries to achieve with the design.

The pedagogical design of the Explore Data assignments is discussed in relation to the pedagogical platform of NSD, stated in documents and on web pages produced by NSD. The perspective of NSD, the producer perspective, is sought brought forth by the technique document analysis. First, some of NSD’s initial pedagogical intentions are presented.

In the application for funds to make S-vev, NSD promises to lay ‘great emphasis on employing the Web’s interactive qualities to create arenas for learning where the students are encouraged to experimenting and participation’ (NSD, 2001c, p. 4, my translation). In a separate ‘About-section’ of S-vev NSD presents the pedagogical idea behind S-vev:

The pedagogical idea behind S-vev is to give the students knowledge and understanding through self-employment with sources and data that describes the society in which they live. The goal is to take advantage of the students’ natural curiosity and inclination towards research and enable students to participate in a process where knowledge is created through the gathering and analysis of relevant information. (NSD, 2001a, my translation)

In the application for funds NSD also says that S-vev will be built on the pedagogical platform, ‘the laboratory of social science’, which has been the platform for NSD’s earlier learning resources (e.g. Ryssevik, 1994). In earlier documents NSD explains that the laboratory of social science aims at developing the students’ thinking and working habits are developed (cf. NSD, 1999, p. 4). The laboratory helps students *learn to learn*. A process is described where students employ research data and software, and familiarise with the working methods of the social sciences. This is what NSD calls ‘learning to use’; acquiring software skills and methodological tools contribute to qualify the students for higher education and working life. The students also ‘use to learn’; in their work they learn about the society in which they live (ibid.).

In the application for funds for S-vev, NSD points at the opportunity for the students to engage in an ‘exploratory process’¹² (NSD, 2001c, p. 4, my translation) where they tabulate variables of their choice to shed light on a problem area. The goal of the process is that they start reflecting on underlying causes of how the variables are related, and the implications of their findings. The Plans of Work will be designed for the student to enter a ‘researcher role’ (NSD, 2001c, p. 14, my translation).

The pedagogical platform above can be characterised as constructivist. The students are seen as natural researchers who are not yet acquainted with the role of professional researchers. As argued earlier the Explore Data assignments in the Plans of Work are the main arena where students are encouraged to work with research data. It is appropriate to look into how NSD’s constructivist pedagogy is reflected in the Explore Data assignments.

The predict–observe–explain model in the assignments can be connected to constructivist pedagogy. There is a notion within constructivism that development of understanding starts from existing ideas. Within such a framework it becomes important for the student to explicate the initial ideas, thus the prompt for a prediction. New information is presented, for the student to

¹² Norwegian: Eksplorerende prosess

observe. The student must accommodate new information to initial knowledge. Alternatively, the new information requires a change in the student's way of understanding, and the student alters or restructures his or her initial knowledge. By prompting the student to explain what is observed, the student is lead to reconcile the new information with the initial knowledge.

From the wording the assignments also seem to acquaint the students with the tools and methods available to professional researchers. Thus, the work in the assignments will be measured against the practice of 'real' social scientists. A conduct found both in the assignments and among social scientist is generating hypotheses: 'Researchers derive hypotheses deductively from theories, inductively on the basis of direct observations, on the basis of their experience and intuition, or by using a combination of these approaches' (Frankfort-Nachmias & Nachmias, 2000, p. 56). However, the flexible approach described in the quote is not possible within the Explore Data assignments.

The assignments provide a link in the format 'Open [name of a survey] in NSDstat for web' that forces the user to make a hypothesis that can be tested by the results of a specific survey. Like all surveys, the surveys on S-vev have a predetermined selection and categorisation of informants and operationalisations of research questions. The hypothesis must be made to harmonise with the specificities of the survey, because a 'hypothesis should also state explicitly the conditions under which the relations will be observed' (Frankfort-Nachmias & Nachmias, 2000, p. 57).

In addition to pre-selecting the survey, the Explore Data assignments pre-select the variables for the analysis. This ensures that the hypothesis must be construed on the premise of a completely predetermined examination, instead of the other way around. Unlike social scientists, the user has no control over the examination. For the Explore Data assignments, therefore, the opportunity to enter 'researcher role' is limited, since the hypothesis and other resources for reflection are always related to a prespecified statistical analysis. An earlier NSD document can be used to characterise the Explore Data assignments, although it was originally meant for books: 'Tables and graphical presentations in books and facts collections are static information, where most of the important choices are already made.' (NSD, 1999, p. 5, my translation)

In other words, it is limited 'exploring' in the 'Explore Data' assignments, but in accordance with NSD's idea of helping the student learn to learn, one might expect the assignments to learn students how they can later explore data on their own. With such a rationality the assignments would function as 'scaffolding', that is, they would be designed to facilitate the learner's transition from assisted to independent performance (e.g. Berk & Winsler, 1995). This can happen by giving them practice in the technical skills required, and an understanding of a research practice, so that they later can employ this in an independent exploratory process.

However, if the idea behind the Explore Data assignments is scaffolding, the transition from assisted to independent performance is not well reflected in the assignments. Only a couple of

times the students are asked to choose (among a limited number of) independent variables and another three assignments suggest that the students should explore data freely. Two of these are supplied: 'In the same way, make an own problem formulation and formulate a hypothesis. Test the hypothesis – how will you explain the results? Why not work together?' (Plan of Work 'Last cigarette for the public houses') and 'See if you can find other interesting relations and present these to the class' (Plan of Work 'Democratic nuances').

Another peculiarity of Explore Data assignments as 'scaffolding' is the extensive number of assignments. NSD designed a typical Plan of Work to occupy two subsequent periods of 45 minutes each. The citizenship subject is regulated to two periods per week. Thus, the 35 Plans of work afford activity for the entire school year. Explore Data is the only type of assignments that is present in all Plans of Work. Westrum Hvammen (2003) found that the statistics constituted such a great part of S-vev that it came across as a mandatory part of the work. So, one can ask why NSD has invested so much effort in an extensive volume of Explore Data assignments, if they are only meant as preparations for a later, true exploratory process.

A pedagogy identified in the previous analyses was predict–observe–explain. The following will discuss how this goes along with a scientific conduct in the Explore Data assignments. The excerpt below asks to predict–observe–explain in terms associated with science (Plan of Work 'Keep that bitch away from me'):

1. Before you start making tables and/or figures, you are going to formulate some simple hypotheses on relations you expect to find between religiousness and attitude towards living together and relationship break-up.
2. Use the variables PARENTS STICK TOGETHER and MARRIED STICK TOGETHER as point of departure, and use religiousness as independent variable. How will you explain the relations? Were your hypotheses verified or falsified?

In summary, the excerpt asks for two hypotheses, and then for two tables to verify or disprove the hypotheses. In support of the following argument, the concept of hypothesis will be divided in two sub-concepts. The first sub-concept is an explanation of some observation, happening or relationship. The second is a prediction of what the relation between two variables will be if the explanation is to emerge as useful. In the excerpt, a hypothesis is specified as an expected relation between variables, whereas this specification only covers the sub-concept of prediction. Unfortunately, a prediction not related to an explanation may easily be confused with a guess, not being justified by evidence or reasoning.

After the request for two tables, the excerpt asks whether the hypotheses were verified or disproved. Again, the concept of hypothesis will be discussed by its two sub-concepts. In the excerpt, only the prediction part of the hypothesis can be verified or disproved. The explanation motivating the prediction cannot. The statistical result can only be an initial indicator that the

connection between the explanation and the prediction is reasonable. Even though the connection should emerge as reasonable, it may not be so under all conditions, and at all times. Neither can a single tabulation tell how the relation between two variables has been influenced by other variables.

From the excerpt one can easily get the impression that a complete hypothesis can be verified, both the explanation and the prediction. From a viewpoint of conveying social science to students, this impression would be counterproductive. It would portray statistics as representative of some disconnected, exalted truth. However, to borrow a citation for the natural sciences, science should not be portrayed as a collection of objective facts, but be an explorative process where 'ideas being accepted as being as good as the evidence which supports them' (Harlen, 2000, p. 7).

Why is the scope so narrow for 'verifying' or 'disproving' hypotheses? A reason can be that any subsequent assignments have predefined tabulations, and consequently the students' hypotheses cannot be pursued further. This way of organising assignments work well if the statistical facts are more important than an explorative process. Even if a hypothesis cannot be verified, a prediction can. Accordingly, with a predict–observe–explain scheme, statistical facts can quickly be conveyed and accommodated to the students' previous knowledge. Since the explanation part of the students' hypotheses has no influence on a broader conduct, many of the formulations in the assignments are aimed at contextualising the tabulations, guiding what the predictions should look like, and consequently, guiding what is relevant about the tabulations. The contextualising formulations may be open or closed. An example of an open formulation is: 'How do you believe the relation between party preference and stand towards the EU is?' A closed formulation is for example: 'In which country are people most sceptical to having people of a different race in the neighbourhood, and in which country are people least sceptical?' The contextualising formulations appear across several categories of the content analysis. In addition, most of the uncategorised questions not accounted for in the content analysis have this function.

The discussion so far has probed two interpretations of the Explore Data assignments. First, as an arena for social science research, and secondly as scaffolding for a later exploratory process. Problems were associated with both interpretations, and the later part of the discussion suggested that the pedagogical design is best accounted for when the assignments are looked at as conveyors of statistical facts.

The discussion raises the question of how the pedagogical design fits with the wider practice of which S-vev and the Explore Data assignments are part. A rationality for the design may be found with characteristics of the producer. Although NSD is a research institution in the sense that it gathers, systemises, stores and make available data, it does not conduct the analysing or concluding part of the research enterprise. NSD presents itself like this on the index page of its web site:

The Norwegian Social Science Data Services PLC (NSD) is a service institution for Norwegian research. The main objective is to offer services to researchers and students regarding gathering and access to data. (NSD, 2003, my translation)

Their statutes also add that NSD has an ‘obligation to convey data and information on Norwegian life and institutions to the educational system and the general public’ (referred in NSD, 2001c, p. 17, my translation). In relation to the statutes, it makes sense that the Explore Data assignments can be said to contextualise and convey data to the students rather than assisting a process of student guided inquiry.

Another rationality can be traced in the relation between the National Board of Education's formal requirements and NSD's accommodation to this. The contract between the National Board of Education and NSD contains the formal requirements for the digital learning resources. Here, the board states that the resources ‘should be developed according to the goals in the National Curriculum’ (Læringscenteret & NSD, 2001, Appendix 1, my translation). In an addendum to the call for tenets, the board states what will improve a project’s chance of winning:

Projects that are supported may be projects that substitute or supply the traditional textbook by:

- Making the textbook electronic.
- Offering theme related *interactive components* that can be used as a supplement to the traditional textbook or another digital learning resource.
- Substituting the traditional textbook by *thematically covering the goals in the National Curriculum*. Such projects can arrange for a holistic learning situation for the student, where among other things discipline crossover and project oriented thinking are included. The learning resource can also contain administrative and pedagogical tools for students and teachers.

(Læringscenteret, 2001a, p. 1, my translation and emphases)

In the specification of S-vev, NSD echoes the board’s formulations (compare the emphases in the two quotes):

The learning environment is going to appear as a uniform and integrated collection of *interactive components* that will *thematically cover all the goals in the National Curriculum*. (Læringscenteret & NSD, 2001, Appendix 2, my translation and emphases)

As Watson (1997) notes, ‘texts are often designed to engage with a specific set of presumed relevances amongst readers’ (p. 89). In the quote it seems NSD is trying to answer

the board's specifications by using the same words as the board. One of the formulations that is similar for the board and NSD is worth a closer look, namely; 'will thematically cover [all] the goals in the National Curriculum'. The formulation implies that the goals can be *covered* by the themes in the digital learning resource rather than *supported*. If the board had taken its talk of a 'holistic learning situation' seriously, a more appropriate formulation would be that: 'thematically, the digital learning resources should support a learning situation in which the goals can be obtained'. By holding fast to the textbook, and by asking for the digital learning resources to *cover* the goals, the board favours content over process in education. Such a preference does not follow from the National Curriculum, because, as explicated in the Background chapter; the goals in the National Curriculum do not only specify learning content, but also understanding, ethical skills, and skills for discussion and communication. The board's suggestion of making the textbook electronic is unexpected, bearing in mind its prior quest for creative pedagogical solutions in the Plan for Digital Learning Resources 2001–2003 (Læringscenteret, 2001b). Although, a possible explanation may be the aforementioned public pressure for free textbooks at the time.

In the answer to the board's formal requirements, NSD echoes the board's formulations in their own formulation that the interactive components in the learning environment will thematically cover all the goals in the National Curriculum (see quote above). From the context to the quoted excerpt, it is clear that the term 'learning environment' refers to S-vev alone, not the environment of which S-vev is part. Pushed to its logical conclusion, NSD here commits to making S-vev cover all the curricular goals alone, without relying on teacher guidance, or student initiative.

There are other indications of such a rationality, apart from the fact that the Explore Data assignments are very much contextualising of the data. For example, the 35 Plans of Work together contain just as much text as a traditional textbook. If NSD were working from a rationality that the board should be able to, so to speak; pinpoint the exact places in S-vev where the different curricular goals are conveyed, this may have compromised the originally stated constructivist pedagogy.

Building on the content analysis, this section has applied document analysis in a discussion of the pedagogical design of the Explore Data assignments. In this manner, the assignments have been related to the setting of the producer.

7.3 Discussion

The following will discuss the findings in Phase I in light of related literature and findings. The research question in Phase I has been:

What is the pedagogical design of the Explore Data assignments; which activity does the producer envision this design to support, and what do the provided resources look like?

The document analysis shows that the producer envisions the design of S-vev to support an exploratory process for the students, a process where knowledge is created through the gathering and analysis of relevant information. The pedagogical platform of S-vev is the laboratory of social science. NSD envisions that S-vev will function as a laboratory the way we recognise it from the natural sciences, but with social science data. The idea is to cultivate students' thinking and working habits – to help the students learn to learn. The goal of the exploratory process is that when students tabulate variables to shed light on a problem area, they start reflecting on underlying causes of how the variables are related, and the implications of their findings. The Plans of Work are designed to support students in entering a researcher role. The activity the producer envisions the design to support can be theoretically labelled constructivist.

The analyses of how the resources look that are provided for the work with the Explore Data assignments show that the resources do relate to NSD's vision. The analyses show that the assignments are built on a model resembling the model predict–observe–explain, widely used in laboratories of science education (Harlen, 1992). First, the students must predict the outcome of an event and must justify their prediction; then they describe what they see happen; and finally they must reconcile any conflict between prediction and observation. This relates to the constructivist notion that new pieces of information must be reconciled with existing ideas.

The approach in the Explore Data assignments has similarities to an approach promoted by many textbooks in the social studies education. Reynolds (2001) noted that most Social Studies / Social Science textbooks have explanations of an inquiry process with a sequence of activities to guide students through a meaningful social investigation. Reynolds describes the sequence:

Although there are a number of different ways of classifying this sequence it basically revolves around a progression of framing and focusing questions; locating, organising and analysing evidence; evaluating, synthesising and reporting conclusions; possibly taking action of some sort; and reconsidering consequences and outcomes of each of the above phases (Reynolds, 2001, pp. 20-21)

The similarities between the Explore Data assignments approach and the textbook approach is especially in the wording. The wording in the Explore Data assignments encourages these activities. However, the activity modelled in the assignments differs from the activity described in the textbooks by already having located the evidence. The variables for tabulation in NSDstat for Web are already fixed. This makes the activity in the assignment differ from the inquiry process Reynolds describes. The depiction in textbooks is that 'the inquiry process is recursive in nature, and depends upon a view that students are to be strongly involved in the inquiry process' (Reynolds, 2001, p. 21).

Reynolds notes that difficulties have been reported in implementing the activity sequences. The Explore Data assignments may circumvent some difficulties by specifying all operations needed to solve the assignments.

The analyses of the Explore Data assignments showed that variables for statistical analysis are predetermined in the assignments. In solving the assignments, one is not free to pursue an own inquiry. Since reflection is not permitted to influence how NSDstat for Web is used, reflection and statistical work is in a sense disengaged. Such pedagogical design is not really promoting an exploratory process. Rather, it is suitable for conveying data.

When the assignments employ a predict–observe–explain model, without furthering a recursive and evolving inquiry process, the assignments come out with a routine character. The work with the assignments is specified step-by-step. Within research on laboratories of science education, such an approach has been called a cookbook approach. Pushkin (1997) criticises cookbook labs, arguing that ‘when students are regimented by lab manuals that dictate what to think, how to think, and when to think, lab activities essentially lose impact for learning’ (p. 240). Thus, in pursuing how the laboratory of social science works in praxis, it may be productive to relate the findings to research on laboratories in science education.

In the Plan for Digital Learning Resources 2001–2003 the National Board of Education stated that the digital learning resources in citizenship should advance creative pedagogical solutions. The result of Phase I shows that NSD had high visions for the pedagogy of S-vev. Even so, the pedagogical design can, to play on words, be characterised by a lack of creativity. This result changes the initial aim of observing creative pedagogy *realised* in praxis. An aim can still be that that the pedagogy in praxis will prove creative in its own right. After the analyses and discussions in Phase II, chapter 11 will relate the findings of the two phases.

Phase II: Praxis

Chapter 8 – Techniques and Data

Chapter 9 – Analysis for the Sixth-Form College

Chapter 10 – Analysis for the Technical College

8. TECHNIQUES AND DATA

8.1 Choice of Techniques for Gathering and Analysing Data

The first section of this chapter shows how Phase II is designed. It motivates methodologically why the different techniques for gathering and analysing data were selected.

As pointed out earlier the Explore Data assignments are a resource in the students' setting. From a sociocultural perspective, one should study the resource together with those utilising it, since the actual use determines *in what way* the Explore Data assignments are a resource. For the second phase of study, techniques were needed that can help to answer: What characterises the students' interaction during the work with the Explore Data assignments, and which resources are used in the interaction?

Interaction analysis

Interaction analysis (Jordan & Henderson, 1995) is concerned with the interaction and resources in interaction. Phase II will therefore use interaction analysis as an ethnographic technique, inspired by Jordan and Henderson's (1995) description. They define interaction analysis as 'an interdisciplinary method for the empirical investigation of the interaction of human beings with each other and with objects in their environments' (p. 39). Interaction analysis is developed for microanalysis of electronically recorded interaction, and provides a set of analytic focuses that repeatedly have proved to be productive within a research practice.

An initial motivation of this study was the opportunity to observe a pedagogy in praxis. It is therefore useful also to look at the students' interaction as a learning process. This is not a new turn for analysis, as a central sociocultural thought is that learning is a property of all human activity: 'People cannot avoid learning, the question is what they learn in different situations' (Säljö, 2002, p. 16, my translation). Jordan and Henderson (1995) relate the analysis of interaction to learning processes:

Interaction-Analytic studies see learning as a distributed, ongoing social process, in which evidence that learning is occurring or has occurred must be found in understanding the ways in which people collaboratively *do* learning and *do* recognizing learning as having occurred (Garfinkel, 1967). (Jordan & Henderson, 1995, p.42, emphases in original)

As people always learn it is fruitful to study the conditions under which they develop competencies and skills of different kinds. When studying the interaction we will also be able to say something about what comes out of all this, in terms of learning.

Interaction analysis is in this study incorporated as a technique in an ethnographic methodology. In their own practice Jordan and Henderson have also worked out of an ethnographic methodology.

Our own practice has been to do videotaping in conjunction with ethnographic fieldwork. We rely on participant observation, in-situ interviewing, historical reconstruction, and the analysis of artifacts, documents, and networks for providing the framing context. In the course of this ethnographic work, we attempt to identify interactional ‘hot spots’ – sites of activity for which videotaping promises to be productive. Ethnographic information then furnishes the background against which video analysis is carried out while the detailed understanding provided by the micro-analysis of interaction, in turn, informs our general ethnographic understanding. (Jordan & Henderson, 1995, pp. 42-43)

Jordan and Henderson argue for a strategy of identifying ‘hot spots’ in the activity. This is similar to my own strategy in the research design of making ‘incisions’ at particular points in the larger setting, group, or institution (Berg, 1998). The selection and analysis of incisions or hot spots must be informed by ethnographic information.

As seen from the quote, microanalysis and ethnographic information work together to form a general ethnographic understanding. This is similar to the common categories of micro- and macroethnography. The scale from micro- to macroethnographic information has relevance for the understanding of resources in interaction. The theoretical framework presented three dimensions of interactional resources; co-textual resources, situational resources and background assumption resources. Co-textual resources are the prior discourse in an encounter, and the situational resources are the immediate perceptual environment with its persons, physical spaces and artefacts. These are directly available to microethnographic inquiry by the techniques of observation and electronic recording. Background assumption resources, on the other hand, are not directly and publicly manifest in the perceptually available situation and behaviours. The background assumption resources are mediate resources. Although they play a role in the

encounter under study, they cannot be understood without a broader ethnographic context. The technique of interviewing can shed light on both background assumptions and ethnographic context.

It is an aim of Phase II to analyse which resources are used in interaction; therefore all three dimensions of interactional resources are relevant. Data collection techniques will be applied that can inform all three dimensions; electronic recording, observation and interviewing. These are presented in the following.

Electronic recording

Jordan and Henderson (1995) claim that 'only electronic recording produces the kind of data corpus that allows the close interrogation required for Interaction Analysis' (p. 39). This is because many resources in interaction are volatile. For example, the details of body language or indications with a computer mouse cannot be remembered for long. Electronic recording stand out from other techniques by the persistence and richness of the produced material. Recordings can be played over and over again, and this enables a thorough and consistent approach to the characteristics of interaction.

The students' body language will be an important aspect of interaction; therefore a video camera will record their gestures and facial expressions. The camera will be unoperated, so literally, what to focus on will be decided only once, when the camera is mounted. This ensures both inner consistency of the recordings and discretion during recording.

The role of the Explore Data assignments as a resource is also central. Much information about how the assignments are used is visible on the computer screens. This information will be captured by screen-cam software. In the recent years there has been development within computer hardware and software, making it possible to digitise and edit video on personal computers. I will therefore attempt a, to my knowledge, unrealised endeavour to merge the video and several screen-cam recordings so that they are always synchronous during playback.

Recording as a technique for data collection is compatible with the ethnographic emphasis on the need to disrupt the social processes as little as possible. Yet, there must be a concern for whether the knowledge of being recorded makes people alter their behaviour. Phillips (1982) notes that those recorded cannot do what they are there for if they change much. Jordan and Henderson (1995) refer to co-analysts who found that their participants habituated to the camera rather quickly. Nevertheless, as Jordan and Henderson point out, the influence of the camera must be judged in each case.

Observation

Although electronic recordings produce detailed data about the students' interaction, they cannot replace the researcher's active presence. For, as Wilcox (1982) points out, a person constantly

absorbs a wider variety of data than any mechanical device can record. True ethnographic knowledge requires direct contact with the phenomenon being studied.

The design of Phase I drew on participant observation at NSD, because this brought inside knowledge of the pedagogical background for S-vev. Phase II also has a goal of in-depth knowledge. However, this cannot be gained by participating as an insider among students. In this case, ethnographic methodology suggests mere observation as a technique, without participation:

‘Observation’ is distinguished from participant observation by the fact that interactionally the observer's role is more one of reception of communicative behaviour than the participant's role. Therein lies its chief virtue: it is possible to receive more information when one is not obliged to produce it. It is, of course, necessary that an observer's role be culturally permissible and socially appropriate for that mode of data collection to be used. (Phillips, 1982, p. 202)

Ethnographic observation of a social setting has traditionally been conducted over a lengthy period (Tedlock, 2000). Since the analysis in this phase has interaction analysis as main technique, most of the time resources will be allocated analysis of electronic recordings. Observation is here used as a data collection technique to provide the necessary context to the recordings. Presence during the recording will enrich and supply the information in them. Observations before and after the recording, for example by having contact with the teachers and schools, will broaden the information in the recordings. For a cultural understanding, it can be additionally helpful that I have been a college student myself, and that I have practised as stand-in teacher in primary school.

Interviews

Interviews will be conducted to shed light on the ethnographic context and the students' background assumptions. This is what Spindler (1982) called the sociocultural knowledge participants bring to the social setting being studied. Additionally, the interviews will be an opportunity to show the students clips of the electronic recordings, and hear their view of what happened in the clips.

There will be one interview for each student group. Group interviews are preferred instead of individual interviews because Phase II deals with students' interaction. Hence, it appears counterintuitive to keep the students' interaction out of the interviews. Some researchers have a principal stance to whether group interview or individual interview gives the most valid results. Morgan (2002) states that ‘it makes more sense to treat each method as more useful for some purposes and less useful for others’ (p. 151). In group interviews, the interviewer will typically be talking less, and the interviewer will possibly play a lesser role for the participants' definition of the interview situation. This way, the participants' own view may come better forth.

Having settled on a type of interview, the design of the interviews can be considered. For example, the kind of questions asked is important:

Since the informant (any person being interviewed) is the one who has the emic, native cultural knowledge (in varying degrees of self-conscious articulation), the ethnographic interviewer must not predetermine responses by the kinds of questions asked. The conversational management of the interview or eliciting interaction must be so carried out as to promote the unfolding of emic cultural knowledge in its most heuristic, 'natural' form. (Spindler, 1982, p. 7)

To be able to adapt to the students' own accounts through the interviews, the interviews will be semi-structured. There will be interview guides containing a number of themes that should be dealt with. The order and accentuation of themes, however, can emerge during interview. It can be useful to have more questions in the interview guides than needed. Then there will be different formulations and thematic approaches to choose from, during the course of the interview. The preparation of questions in advance will also give practice in formulating questions that have an open style. Wengraf (2001) notes that sequencing of questions in interviews is important. A question will get a different response if asked in the beginning as opposed to later in the interview. As a rule, themes and questions should move from general to specific.

At the time of the interviews, video data from the work with the Explore Data assignments will already be collected. This gives the opportunity to hold what Jordan and Henderson (1995) calls video review sessions in the interviews, showing the students sequences of their prior work. Video review sessions work best after initial analysis of the video data, so that the video clips shown to the students represent incidents of interest to the analysis. Students can then give their account of what happens in the clips, and possibly shed light on which background assumptions are at work in the interaction on the clips. Jordan and Henderson (1995) remark that video data 'represent the participants' perspective, their view of the world, which may contrast substantially with the analyst's' (p. 49). By asking questions based on initial video data, one can stay much closer to the actual events, than if interview questions refer to the work without video. The students' answers will thus be more directly relevant to the work with Explore Data assignments, and will have greater 'ecological validity'.

As mentioned, a goal of the student interviews will be to know more about the ethnographic context. Interviews with the two teachers may also obtain valuable background information. The teacher in the sixth-form college is particularly interesting, because, as both co-author on S-vev and teacher, he can provide background information for both the NSD setting and the school setting.

As a concluding remark, it is important to say that the interviews are not a means of re-accessing what happened when the students worked with the Explore Data assignments, the interviews must

be analysed as situated in a separate setting. As Bloor et al. (2001) point out, research methods are not readily substitutable; in any given research setting one particular technique will be more suitable for the particular research topic than any other. The techniques in this phase will not be used as substitutions to one another, nor as a measure of validity in any simple manner, rather will they be used to deepen the understanding of the analysis of the electronic recordings.

8.2 Description of Analytic Technique

8.2.1 Interaction Analysis

In this phase of study, interaction analysis was chosen as the only analytic technique. For interaction analysis Jordan and Henderson (1995) offer a set of 'analytic focuses' that have turned out to be productive in analysing video data in a wider circle of practitioners. These focuses were basis for the analyses for the two schools. The analytic focuses are; the structure of events, their beginnings and endings, their segmentation, the temporal organisation of activity, rhythm and periodicity of activities, turn-taking, participation structures, trouble and repair, the spatial organisation of activity and artefacts and documents. The presentation of the analytic focuses are based on Jordan and Henderson's description (1995, pp. 57-79).

The Structure of Events

People's experience of time is bunched into 'events', such as for example meals, tutoring sessions, bedtime stories and so on. Though events need not have names assigned to them, they may simply be stretches of interaction that cohere in some manner that is meaningful to the participants. In the process of identifying events, analysts must draw upon their own cultural knowledge. The identification of events can be a first step towards analysis and will often overlap with content logging.

Beginnings and Endings of Events

Events always have beginnings and endings, but generally, a more complex structure can be discerned. For example, a lesson may have an 'official' start with a verbal announcement by the teacher that gets the class' attention. However, even if an event is marked by an official beginning, this is often preceded by participants' verbal and nonverbal preparatory activities and, after the event is officially over, there is some period of time during which people disengage. Significant interactions tend to happen in the starting up and winding down process. These phases will often be marked by re-arrangements of artefacts.

Segmentation of Events

Events are always segmented in some way. They have an internal structure that is recognised and maintained by participants. An analytic interest here is the ways in which participants make that structure visible to themselves and each other, how they ‘announce’ in some sense the fact that they have reached a segment boundary in the work and that the next stretch of interaction will be of a different character. Many learning and work activities involve a known (or at least discoverable) projectable sequence of events. For example, students may know that they have a given number of problems to solve and if that work is to be accomplished together, the transition from one problem to the next must be achieved together.

The Temporal Organisation of Activity

Interaction analysis examines the temporal organisation of moment-to-moment, real-time interaction. In focus is the shape of an event, its high and low points, the relaxed and frenzied segments and the temporal ordering of talk and nonverbal activity. Moreover, interaction analysis gives access to the ways in which participants experience and make visible the temporal orderliness of the events they construct. Often, activities are organised by externally imposed timetables. In such settings the selection, spacing, pacing and completion of activities is sensitive to their positioning vis-à-vis anticipated schedule events.

Rhythm and periodicity of Activity

Some measure of rhythmicity or periodicity is a common feature of human activities. In schools, for example, class periods provide major temporal structuring, or the periodicity is provided by the nature of the task as when a group of students has a series of problems to solve. Some rhythms are driven by technology, as for example the activities of installers working on an assembly line. People’s knowledge of the rhythmic and periodic features of activities can itself furnish as a resource for the management of contingencies as they arise, and thus predictability and projectability of action sequences can emerge. Interaction analysis looks both for the repetitive, routinising aspects of activity sequences and for their variability.

Turn-taking

Turn-taking describes the sequencing of people’s participation in an interactional exchange system. Theory about turns began as a description of how people take ‘turns at talk’. Interaction analysis also looks at how people take ‘turns with bodies’ and ‘turns with artefacts’. For example, a group of students around the computer can take turns with the mouse. The different kinds of turns mix in interaction, and turns at talk may well be answered by ‘body language’ and vice versa. However, some activities have a primary focus on either talk or bodily movement. In some situations, whatever it is that is to be accomplished in the interaction is primarily accomplished in the talking. The prime example is the telephone conversation, but other examples are business meetings, police interrogations, lectures and story-telling sessions. Such ‘talk-driven interaction’

can be contrasted with ‘instrumental interaction’, where activities are motivated by the requirements of a physical task that has to be done. This is the case when, for example, surgery is performed, a car is repaired, homework corrections are made and so on – activities that crucially involve the manipulation of physical objects.

Participation Structures

Participation structures concern the extent to which co-present individuals share a common task orientation and attentional focus. Mutual availability and alignment become visible in ‘participation frameworks’ – fluid structures of mutual engagement and disengagement characterised by bodily alignment (usually face-to-face), patterned eye-contact, situation-appropriate tone of voice and other resources the situation may afford. For example, the orientation to a computer yields a different gaze and body orientation as compared to group interaction around a table. Relevant issues for interaction analysis, then, revolve around such questions as: how do interactants make their engagement (or lack thereof) visible to each other; what strategies do people employ to gain entry; how do artefacts and technologies support or constrain particular participation structures; and the like.

Trouble and Repair

Another analytic interest for interaction analysis is the occurrence of ‘trouble’; that the normal stream of activity is broken in some way. Careful analysis of the breach can often reveal the unspoken rules by which people organise their lives. Interaction analysis needs to take into account not only the verbal aspects of repair, but also the ways in which participants draw on their bodily, artefactual, spatial and social resources to mend infractions of projected sequences. Analysis of hitches in interaction may also reveal some of the constraints in the material world that routinely cause trouble. For example, one such area of investigation is the repair of trouble in the interaction between humans and computers. In their interactions, people pretty much assume that they share rules of interpretation. This assumption becomes problematic when computers are involved. Trouble occurs when there is a ‘miss-match’ between the rules and procedures employed by the user and the computer in interpreting meaning from a sequence of symbols.

The Spatial Organisation of Activity

A trivial observation about human existence is that people occupy space. Human beings’ size, their sensorimotor abilities and their shared ways of orienting to a social and material world facilitate certain uses of the space around them and make difficult, or prohibit, others. People manage their physical co-presence by socially recognised (though often unstated) expectations regarding occupancy of space, interaction with others, use of objects and resources, display of physical presence, and voice. Interaction analysis, then, looks at the ways people make use of these mutual expectations as resources for structuring their interaction with others and for accomplishing the business at hand.

Artefacts and Documents

Artefacts are ubiquitously present in all human endeavours. Sometimes they constitute the focus of an interaction, as when two people work together over a blueprint or at a computer terminal. Sometimes they are co-incidental to it, as when a pencil is used for gesturing and tapping in the course of talk during a working session. For interaction analysis, the basic premise is that artefacts and technologies set up a social field within which certain activities become very likely, others possible, and still others very improbable or impossible. A central interests lies in understanding what kinds of activities and interactions particular material objects engender and support, and how these change as different artefacts and technologies are introduced.

8.3 Data

When teachers were contacted about participating in the study, relatively few teachers were employing S-vev in the education (Lieberg, 2002). This was also the impression at NSD when they met teachers on S-vev courses. One of the hired co-authors on S-vev, however, was a teacher and based his citizenship teaching solely on S-vev instead of textbooks. Recall that the research design made selection criteria to arrange for optimal conditions for observing the 'creative pedagogical solutions' in action. The teacher met the criterion of experience with S-vev, and as a co-author he had inside knowledge of NSD's pedagogical goal with S-vev giving him a special opportunity to realise it in praxis. He agreed to take part in the study. To get in contact with another teacher, I asked the course leader of the S-vev courses if she could spot another teacher that would meet the criteria. She suggested a teacher who showed understanding of the course work with S-vev. The teacher planned to employ S-vev a full day in her class. This ensured that I would be able to collect enough data. In addition, the teacher was doing her main subject in social science on the university. It was therefore reasonable to expect her to understand NSD's pedagogy for S-vev, and to be able to assist her students in attaining the goal of acting in the role of social scientists.

The teachers' respective classes fulfilled the selection requirement of knowing how to operate computers. One class specialised in ICT technical services maintenance, and the other had long experience on operating S-vev in the citizenship subject. The teachers reported that the classes had acceptable computer equipment and internet connection.

The class with S-vev experience belonged in a sixth-form college. They had been using S-vev instead of textbooks for more than half a year in citizenship. A point to observe is that the class had been set up to gather those students on the school that were going to participate on an excursion abroad. Consequently, the students may come from affluent homes, and thereby may perform better than average. With selection criteria for optimal conditions, this should not be a problem.

The class specialising in ICT technical services maintenance attended a technical college in a rural area. The class had never used S-vev before. Compared with the other class, this can give indications whether some ways of working with S-vev can be attributed to experience.

Concerning the selection of the student groups, I selected students who both had the necessary computer skills, and the motivation to concentrate on the work with S-vev. This would increase the chances of observing 'successful' use of S-vev. Moreover, I looked for groups with a high degree of interaction. The presumption was that if a group explicated their thoughts through interaction and talk, it would be easier to say something specific about what they were thinking and doing. The groups were selected by conferring with the teachers, and by initial observation.

Observations

Together with electronic recordings in the two schools, I was observing the students' work in person. As quoted during the selection of the technique, it is necessary that an observer's role be culturally permissible and socially appropriate. Therefore, I had the teachers introduce me to the classes, and I told the students about the research project, including how the collected data would be used. The selected groups were told that no way of working would be 'good' or 'bad' to the research, and that they would not be measured on how 'clever' they were.

The observation was on the students' work with S-vev in general, not only the work with the Explore Data assignments. This included class discussions related to S-vev. The observations functioned 'to gain an understanding of the activities, and their organizational and institutional domain' (Heath, 1997).

During the sessions in the two schools, I had a passive role, seated about three metres from the respective student group, with body half turned away. This was close enough to hear most of what was said, and at the same time keep an eye on other activities in the classroom. During the observation, interesting episodes and situations were written down. The field notes were not employed much in the analysis, but they gave a first direction to analysis.

Documents

The teachers in both schools had prepared lists of what should be done for each period. These 'Teacher's Plans' were collected. In addition, the students documented their work, and answered S-vev questions in digital documents. Although the documents visible in the screen-cam data during production, the final versions were collected.

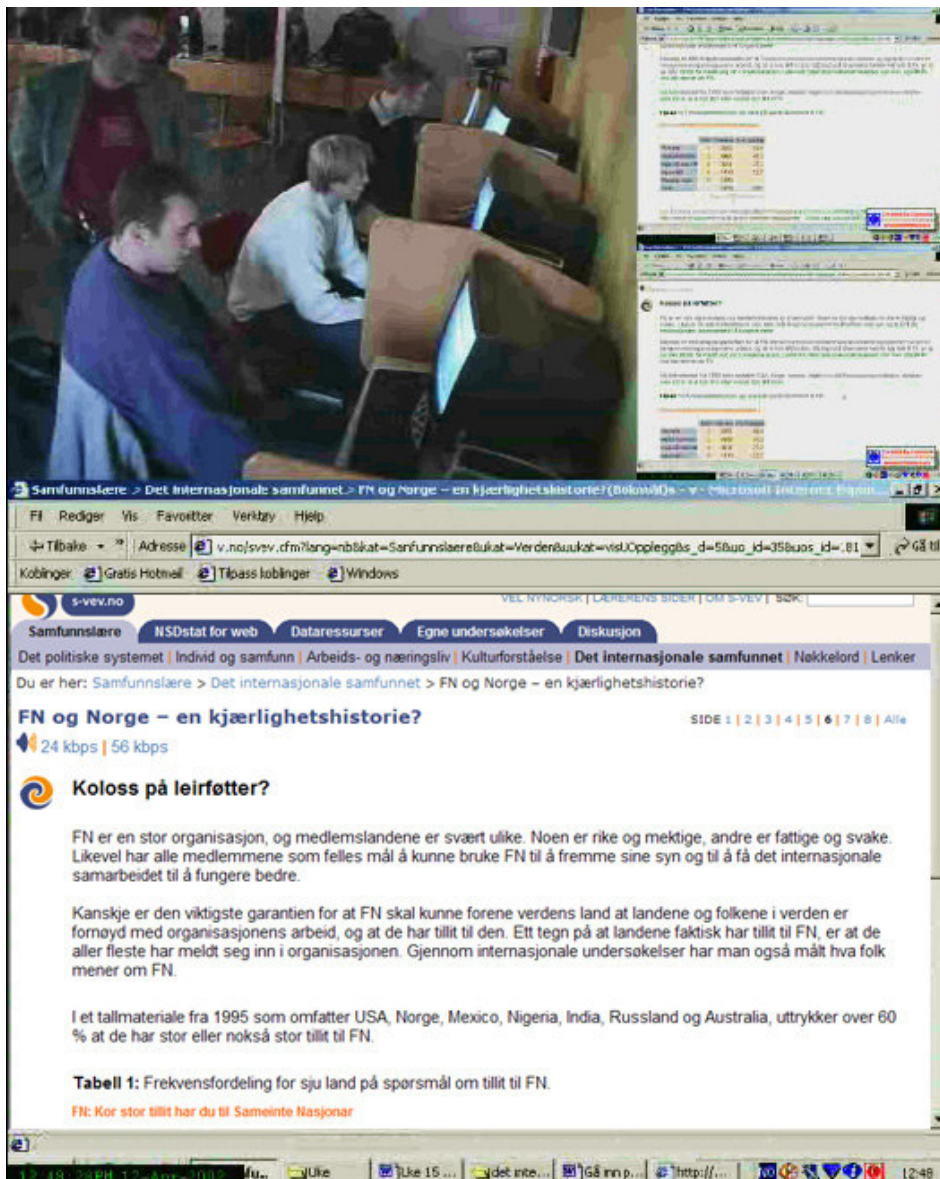
Electronic Recordings

The student group in each class was captured on video. The video camera was rolling most of the time I was there, not only during the work with the Explore Data assignments. Thus the students did not know exactly which part of the recordings would be used for research. In this manner the

students had the chance to get used to the camera. Moreover, they did not treat the Explore Data assignments notably different from other tasks in S-vev.

In addition to the video recording, everything displayed on the computer screens was captured by software. Audio was recorded by both the camera and a mini-disc recorder with a small microphone placed on the desk between the pupils. The use of a mini-disc recorder had a threefold mission. First, mini-discs provided excellent recordings; the sound quality equals the CD format in fidelity. Secondly, the opportunity to create and name track marks was helpful to mark interesting points in the interaction. Thirdly, the recording secured redundancy if another recording device should fail. This last precaution came to its right, as the sound from the camera's microphone was spoiled by noise.

Figure 9: A still from one of the composite movies



The video footage of the students was digitised and stored on the computer together with the screen-cam videos and the mini-disc audio. The recordings from the different media were synchronised and merged to one composite movie in Adobe AfterEffects. This procedure was repeated for all recorded periods in both schools. Each resulting composite movie facilitated several views into the activity.

Figure 9 shows a still from one of the composite movies. The upper left of the still shows the three students in the sixth-form college group, with the teacher currently passing by. The upper right shows the screen for the student furthest away. The middle right shows the screen for the student in the middle, and the lower part displays the last student's screen. The black bar at bottom left displays date and time.

When a composite movie is playing back, the screen-cam views display the students' actions, including which web page or application they are in at any given time. One can follow the students' actual mouse-movements and actions like selecting text or producing text. Due to the limited space for the two upper-right screen-cam views, the text in these views is too small to read. However, the text these two students produce is available in their personal documents. If further information is needed, the full-size versions of the screen-cam videos are always at hand.

In one period, the sixth-form college teacher carried a microphone in his belt as he visited various groups during their work. This recording gave a better understanding of the teacher's perspective.

Interviews

After an initial analysis of the classroom observations and the electronic recordings, each of the teachers and student groups were interviewed.

The student group interviews were conducted at the respective schools during school time. They were semi-structured, and brought up several subjects, such as previous work with S-vev, what the students thought about the resources in S-vev, the teacher's role, their experience with the citizenship education, and with ICT in education. The students in the technical college had not used S-vev earlier, so previous S-vev work was not a theme.

The student interviews and the interview with the teacher at the sixth-form college were captured on video. To get broad contextual information to the verbal utterances, both the students and I were framed by the camera. The interview with the teacher at the technical college was done by telephone, and notes were taken instead of recording it. This interview only had a general interest, because the teacher had not used S-vev other than in the periods I was present.

Video review sessions

During each student group interview there was a video review session, where students were shown clips from their own work with the Explore Data assignments. The video reviews sessions with

each group took a certain direction based on the classroom observations and the initial analysis of electronic recordings.

The group in the sixth-form college seemed to have a special relationship to a set of terms. The students used the terms to describe requirements for the work with the Explore Data assignments. There was also a special relationship between the terms and the order of conducts. To pursue this impression, a three-minute strip was selected from the video data, containing the students' use of the terms. The group was shown the video clip, including a transcript, and later asked what function the different terms had in their work.

The group in the technical college seemed to have a focus on progression in their work with assignments. A couple of illustrative video clips were shown to the students, and the students were asked about what they saw, and later about their interpretation of specific instances in the clips.

How data was ordered with a content log

In the beginning of the analysis, the mini-disc and video recordings were scrutinized several times to identify interesting situations. An initial centre of attention was changes in the activity. About 200 situations were identified and given short labels. Each label was further annotated with a small strip of transcription or an explanation of what was going on. The labels had been assigned time marks, so that the corresponding video sequences could be reached quickly, and the process of inter-linking interesting sequences was relieved. The content log was used as an index of the video material, and as a map of similarities and themes in the interaction. Below is an excerpt of the content log for the sixth-form college.

Excerpt 1: From the content log for the sixth-form college

Tr #	Label	Description	Length	Video
8	NO-BREAK	Teacher: 'We will just move on, today, folks' [without break between the two periods].	mm.ss 01.00	mm.ss 30.18
9	WHAT-TO-DO	Ulf wants to start with Explore Data assignments. Paal asks Ivar why he is including an Insight assignment in his personal document. Ulf says to Ivar that including the assignment has no relevance.	00.49	31.18
10	EXPLORE-DATA	Ulf: 'If we just go on to page five.' Ivar: 'Yes, there are those questions.'	01.02	32.07
11	VARIABLES	'But which variables are we going to use?'	00.18	33.09
12	FOLDER	'Have you made a folder, or what?'	00.42	33.27
13	WHAT-TO-DO	Ulf: 'If you go to page five, isn't it that one we are going to do?' Ivar: 'I was actually wondering about page four.' Ulf: 'Yes, but there are no questions there.'	00.29	34.09

How data was transcribed

All of the student groups' work with the Explore Data assignments was transcribed, except a few minutes with technical problems. An advantage of transcribing the material was that the transcription eliminated the time restraints of the video. The transcription allows the eye to wander around in the represented interaction. Videos can of course be reeled, but at a given point, one has to stop and watch one second after the other.

Transcriptions can be seen as augmenting the video with other forms of presentation. The transcripts by themselves hide some information and highlight other. Watson (1997) points out that transcriptions in this manner risk introducing an artefactual element into the ethnographic analysis. To transcribe is inevitably about making choices: 'There cannot be a perfect transcription of a tape-recording. Everything depends upon what you are trying to do in the analysis, as well as upon practical considerations involving time and resources.' (Silverman, 1993, p. 124) The selective nature of transcription implies it must be viewed as part of analysis, not only as preparation for it.

The transcription was formed in accordance with a convention specified in the appendix. One reason for selecting this particular convention was that it accounted for actions and events, including when these start and end in relation to talk. Another was ease of reading. For example, as Edwards and Lampert (1993) note, some conventions use the question mark for rising intonation alone, not for grammatical interrogation, as in *Who are you.* versus *Who are you?* Such conventions were avoided to prevent interference from conventional usage. Note that the transcriptions were made from the composite videos, merged from videos of the students and screen-cam videos. The chosen convention ensured that non-verbal action, like the interaction with the computer, was properly accounted for in the transcriptions.

Transcribing and analysing were intermixed. Analysis of excerpts in the transcription was done together with the corresponding video sequences. The analysing continuously made new events and aspects of the video material relevant, and these were in turn developed in the transcription. As a tool for analysis, turns and segments in the transcripts were also annotated with thoughts and analytical considerations.

The interviews with the student groups and the teacher in the sixth-form college were also transcribed. No particular convention was used. Only the talk was transcribed, since the artefacts and body language had a less role in this setting. However, these contextualising resources were present in the further analysis of the transcriptions, as the videos were consulted for selected excerpts.

9. ANALYSIS FOR THE SIXTH-FORM COLLEGE

In accordance with the initial selection criterion, the group in the sixth-form college was chosen because the students in the particular group interacted most during the initial observation. The teacher confirmed that the high degree of interaction was representative for their work. Another characteristic of the group was that they all had social science as optional subject, which made them more likely to fulfil NSD's vision of young social scientists.

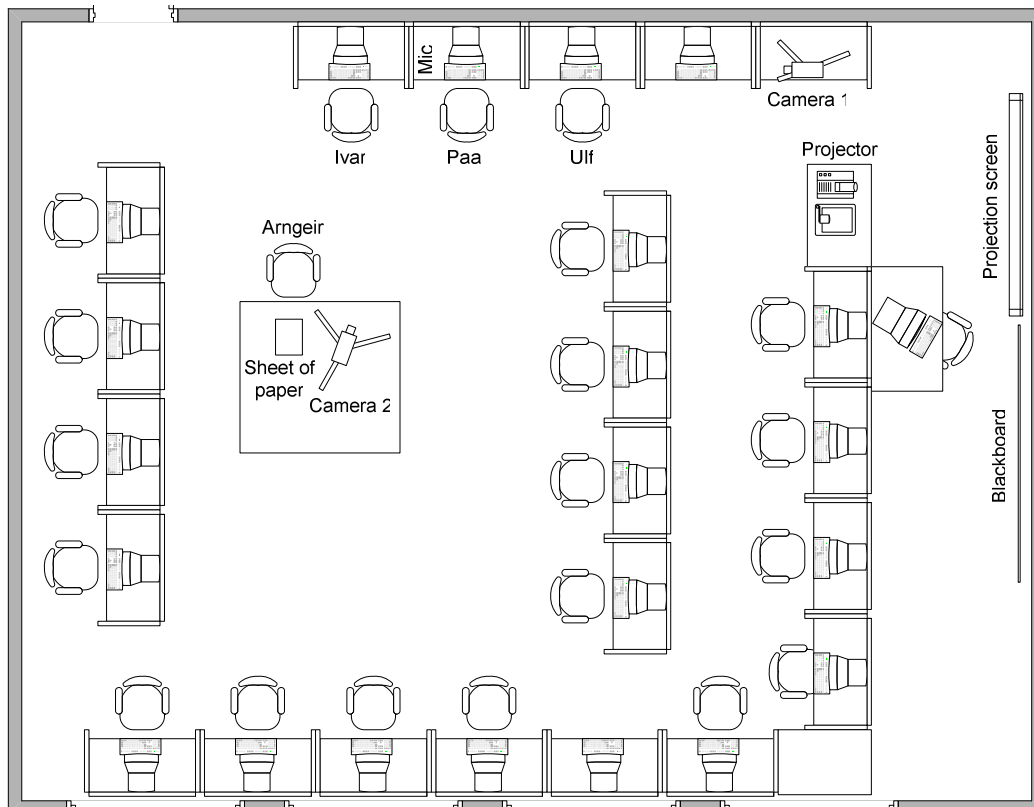
I visited the class four times in the spring of 2001, in week 6, 8, 11 and 15. On the first visit there were no recordings, instead I briefly introduced myself, and the plans for research.

The beginning of this chapter describes the setting that surrounded the work. Then there is an overview of the work, before proceeding to more fine-grained data in an interaction analysis. Lastly, the analysis is discussed.

9.1 Setting of the Students' Work

Physical arrangements

Figure 10: Physical arrangements at the sixth-form college



The classroom is a computer lab arranged to suit traditional lessons, as well. In front resides a blackboard, the master's desk, a canvas and a computer equipped with a projector. Tables with workstations are situated along the sidewalls, with the students facing towards the walls. In the centre of the classroom stand three more ranks, facing the blackboard. There are plenty of open spaces between the ranks, so the students can move freely. Swivel chairs make it easier to shift focus to the fellow students or onto class activity. Keeping attention on individual work is supported by small partition walls between the monitors, so the students did not catch sight of the others' screens, unless they leaned slightly back. I was seated about three metres from the selected group, with body half turned away. A small microphone for the mini-disc recorder was placed between Ivar and Paal. Most of the time, only camera number one was in operation. The first day of recording there were two cameras. During common class activities, camera number two was directed towards the front of the classroom.

The Teacher's Plan

Each week the teacher made a plan telling the students what to do in that week's 2-hr period. The plan, subsequently referred to as the Teacher's Plan, is a digital text document that the class can access on the network. The teacher would typically ask the students to open it in the beginning of the spell. The teacher was seen to push the activity forward according to the plan, as far as time allowed. The example below is the Teacher's Plan from week 11.

Figure 11: Example of a Teacher's Plan (my translation)

<p>Week 11.</p> <p>We will move on to a new topic: The international community. This is probably new and difficult substance for most of you. This requires all of you to take your time to study the factual matter. The first Plan of Work that we will engage in is about the UN. We will look at the UN's organisation and duties, but first and foremost focus on the Security Council. Do you know which country owns the presidency of the Security Council at the moment (March 2002)? As mentioned, this Plan of Work is fairly demanding, and consequently you will benefit from teaming up and working together here.</p> <ol style="list-style-type: none">1. Enter S-vev <u>Social Subject</u> > The International Community and read the introduction page.2. Continue with <u>Social Subject</u> > <u>The International Community</u> > The UN and Norway – a love story?3. On page 3 (in particular) and page 5, you are inquired to look at some of the resolutions of the Security Council. Can you also check what have been the latest resolutions in the Security Council? Follow this link: http://www.un.org/documents/scres.htm4. Can anybody find the plan of meetings for the Security Council in March?5. We will sum up in the course of the work, in the normal way.
--

A characteristic of the Teacher's Plans is that they are organised in a sequential manner with tasks to be solved. A recurring theme is illustrated by the last point on in the plan above. It prepares the

students that there will be a summing up during the spell, in, it says, the normal way. From the observations and interview, this summing up means that the teacher calls on a group to stand in front of the class. S-vev is cast onto the projection screen by the projector, and the student group presents their work and lead a class discussion. The teacher has said aloud in class that the primary goal for the performing group is to engage the rest of the class in a discussion around important issues and concerns in the Plan of Work.

Teacher's Plan redirects the students to tasks in a particular S-vev Plan of Work. In addition to this, the plan typically adds a couple more tasks to undertake. The plan contains hyperlinks to the particular Plan of Work or external web pages.

The personal documents

The students made personal documents with a word processor and saved them in a personal folder on the network. The folders could be accessed only by the owner and the teacher. The students worked on individual computers, so then it was not possible to share a group document. They could neither share contents digitally between their personal documents. The documents typically contained pasted assignments from the Plans of Work, tables and answers to the assignments. Most answers involved tables made with the NSDstat tool. The software used was a version of Microsoft Word that preserved tables and formatting through the copy and paste procedure. Occasionally the teacher collected the personal document of an arbitrarily chosen student in class.

9.2 Summary of the Students' Work

Following the description of the setting, we will turn to the actual work with the Explore Data assignments. It is an aim of Phase II of the study to identify; characteristics in the students' interaction during the work with the Explore Data assignments, and which resources are used in the interaction. Although ethnography strives for a holistic approach, *everything* observed cannot be described. Therefore there will be a summary of the students' work with all of the Explore Data assignments below. Subsequently, the work with a single assignment will be selected for interaction analysis.

The work took place in two 2-hr periods, in Week 8 and Week 15, as the students were engaged with the Plans of Work 'Racism – Understand, act, and change!' and 'The UN and Norway – A love story?'

The first assignment in 'Racism'

Excerpt 2: Assignment number 1 in Plan of Work 'Racism – Understand, act and change!'

You can now continue to work with the data set "*Fellow Citizen Inquiry 2001, Youth Sample – selected variables*".

1. In the data set, you will see that it has been asked questions about several groups in the society. Find out which group the youths would like the least to have as next-door neighbour?

Open "Fellow Citizen Inquiry 2001, Youth Sample – selected variables" in NSDstat for Web

The three students do some interactional work to ensure a common start. Ulf prompts for which variables they need. Ivar reads text aloud, pastes assignment into Word document and says that they need to comment the assignment. Ulf says they need a 'hypothesis-thing'. They once more negotiate a common start, and Ivar reads the assignment text. Paal has already generated most of the tabulations required to answer the question, he silently knows which has the highest score on the 'disliking-scale' but he has not pasted any of the tables into his Word document. To the others, he proposes the following hypothesis: 'But isn't it if it is racists that are most... that they want the least in the neighbourhood?' They all enter NSDstat and select 'racists' as dependent variable. Ulf prompts for an independent variable. All try to sort out which variables to use, because they think they are going to use variable pairs to make cross-tabulations, whereas they need to make frequency-distributions with one variable for each table. After a while, Paal says he has only used one variable per tabulation. Next, Ulf and Ivar generate the frequency tabulation for racists, and Paal does it for the second time. Paal discloses that he found racists to have the highest score (as mentioned he had made tabulations for most of the variables in the data set measuring neighbourhood preferences). They all paste the table into their respective Word documents, and comment the table by saying that it was racists that people would want the least as neighbours.

Excerpt 3: Example of a personal document (Paal's)

[Assignment text:] **1. In the data set, you will see that it has been asked questions about several groups in the society. Find out which group the youths would like the least to have as next-door neighbour?**

Answer:

	Frequency	% of all
Not marked out	63	21,2
Would not like	234	78,8
Total :	297	100,0

It was racists that youth would like the least to have as neighbour. It was almost 80% of those asked who did not want racists in their neighbourhood.

The second assignment in 'Racism'

Excerpt 4: Assignment number 2 in Plan of Work 'Racism – Understand, act and change!'

2. Are there differences in the attitudes of girls and boys? Write down what you believe before you enter the data material to find the answer. Use NOT NEIGHBOUR, ... [ellipsis in original] as dependent variable and SEX as independent variable. Was the result as you believed? What can explain this?

Ulf starts by recognising that the assignment is similar to the previous, but they need to add an independent variable, 'sex'. Paal thinks Ulf moves too fast and refers to the beginning of the assignment: 'Are there differences in the attitudes of girls and boys? Write down what you believe before you enter the data material to find the answer.' He says they have to make a prediction first, and that they should not check the table before they have written down their prediction; 'before we have written what we think'. Ulf affirms that they should write down what they think. Ivar fails to start a discussion on the scope of the word 'believe' in the assignment text. Paal has already made some tables, and states that boys are generally more sceptical than girls are to the different groups of people: 'The boys have had the highest of all until now, except for racists.' Ulf peaks at Paal's hypothesis while writing: 'I believe that girls have more positive attitudes than boys to immigrants.' He asks Ivar (even if he sits further away than Paal) whether he 'can say that'. Ivar walks over and smilingly says it is not only towards immigrants that girls have a more positive attitude. The spell ends before the work is finished.

Excerpt 5: Example of a personal document (Paal's)

[Assignment text, pasted and edited:] **2. Are there differences in the attitudes of girls and boys?**

I actually think the boys have more negative attitudes towards immigrants, and would in a less degree like to have them as neighbour. The reasons for this are hard to know, but it may have something to do with boys might being more drastic in their utterances and might to a greater extent dare to say their actual opinion.

Answer: The boys were the most intolerant towards all the different 'types of neighbours', except for racists... [*sic*]

Ivar had not written anything in his document. Ulf had written a short version of Paal's hypothesis.

The first assignment in 'The UN and Norway'

Excerpt 6: Assignment number 1 in Plan of Work 'The UN and Norway – A love story?'

You can now continue to work with the data set World Values Survey 1995 – Confidence in NSDstat for Web.

1. In which one of the following countries do you believe the confidence in the UN is the highest: In the USA, Mexico, Australia, Norway, Nigeria, India or Russia. Give grounds for why you believe the confidence is particularly great in this country. That is called making a hypothesis or an assumption about a relation. Check the hypothesis by making a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable.

Open "World Values Survey 1995 – Confidence" in NSDstat for Web

Ivar starts by reading aloud the beginning of assignment number 1. He types 'Hypothesis:' in his Word document. He prompts the others for a hypothesis by saying: 'Hypothesis. What are we going to say? Who do we believe has the greatest confidence in the UN? Norway, do they have great confidence in the UN?' The others are not ready to start a discussion yet, so Ivar tries again later, by simply saying 'hypothesis'. They negotiate what will be their hypothesis, and give grounds for why they think the way they do. All three of them generate the table, and start to talk about the result. Ivar talk aloud as he types an answer to the question in the assignment on which country has the highest confidence in the UN. The two others follow up by writing in their own

Word documents, and continue to discuss the result and the wording of the answer. The three students' personal documents ended up very similar.

Excerpt 7: Example of a personal document (Ivar's)

[Assignment text, pasted and edited:] In which one of the following countries do you believe the confidence in the UN is the highest: In the USA, Mexico, Australia, Norway, Nigeria, India or Russia. Give grounds for why you believe the confidence is particularly great in this country.

Hypothesis: We believe that Norway has great confidence in the UN, because they have a lot to do with the UN, and the UN also has great confidence in Norway as a peace-preserving nation.

The vice general secretary of the UN is Norwegian Terje Rød Larsen.

	USA	Mexico	Australia	Norway	Nigeria	India	Russia	Total
Great confidence	9,6	14,4	10,4	11,2	38,7	18,6	14,7	18,9
Fairly great conf.	40,3	37,0	40,0	62,2	35,0	36,8	46,3	41,2
Not so great conf.	36,5	24,1	38,0	24,0	18,1	27,1	25,6	27,2
No confidence	13,7	24,5	11,7	2,7	8,2	17,5	13,4	12,7
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
N=	1421	1487	1954	1110	2612	1060	1442	11086

Here we see that Nigeria clearly has the greatest confidence in the UN with its 38.7%, but if we look at fairly great confidence and great confidence together, Norway and Russia comes up at Nigeria's level and we can really say that the confidence in Norway in the UN is very great.

The second assignment in 'The UN and Norway'

Excerpt 8: Assignment number 2 in Plan of Work 'The UN and Norway – A love story?'

1. Make a cross-tabulation where you use PARLIAMENT as dependent variable and COUNTRY as independent variable. Compare this table with the one you made in assignment number 1. Can we say that the UN enjoys great confidence among people in the different countries when we compare it to the confidence they have in the National Parliament? In which countries do people have greater confidence in the UN than in the National Parliament?

Ulf and Ivar mark a common start of the work by reading aloud a few words from the assignment. The others find out that Ivar had generated the table before the 'official start' and scold him for it. Paal follows up the complaints by saying:

If you had waited for us we could have been collaborating, then it would have become a little bit better, actually, than now when we've just written your-- because now- now you are moving so fast forward that now we just have to rush to copy you. If we had collaborated it would have become better than what it is there.

Ulf and Paal generate the table, too. Ulf instructs Paal to copy the assignment text into the Word document, and to paste the table there. Then they compare the table to the table in assignment 1, and discuss the results. The discussion is lively, advanced, and turn a bit 'tabloid'. Paal interrupts the discussion by saying that they have to concentrate on work 'relevant to the assignment'. Ivar follows up by saying they have to 'run through' the assignment. Then the teacher approaches without saying anything. Ulf says to the others that he is finished with the assignment. They reject that, and say they all need to make a written comment. The teacher starts a new discussion by highlighting a tendency in the statistics, and then he leaves for a short while. The students continue to discuss orally, before Paal says; 'Hey, now we have to comment', while focusing on his screen. However, the oral discussion continues. The teacher approaches once more and says that the table shows that there is much content for politicians. Then the spell ends.

Excerpt 9: Example of a personal document (Ivar's)

[Assignment text, pasted:] 2. Make a cross-tabulation where you use PARLIAMENT as dependent variable and COUNTRY as independent variable. Compare this table with the one you made in assignment number 1. Can we say that the UN enjoys great confidence among people in the different countries when we compare it to the confidence they have in the National Parliament? In which countries do people have greater confidence in the UN than in the National Parliament?

	USA	Mexico	Australia	Norway	Nigeria	India	Russia	Total
Great confidence	3,4	10,9	3,8	6,4	17,2	14,1	1,8	8,8
Fairly great conf.	26,4	32,3	26,7	63,0	19,6	51,3	20,8	31,6
Not so great conf.	56,8	30,9	53,9	28,4	34,2	23,1	45,1	39,4
No confidence	13,4	25,9	15,6	2,1	28,9	11,5	32,3	20,2
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
N=	1460	1447	1998	1117	2611	1665	1877	12175

This survey shows that there is incredibly high contempt for politicians. etc... [sic]

Ulf and Paal's document look the same, but lacks a comment completely.

9.3 Selection of Case for Interaction Analysis

The four Explore Data assignments described above is from the group' work with the Plans of Work 'Racism – Understand, act, and change!' and 'The UN and Norway – A love story?' The students only finished assignment number 1 in each Plan of Work; the work with the second assignment was interrupted because the periods ended. When focusing what to include in the analysis, Stake (2000) recommends selecting the case from which one can learn the most. The student work that was interrupted, does not give the opportunity to see the whole process of working with an assignment.

Phase I of the study found a pattern present in many Explore Data assignments, and showed how this pattern related to the pedagogical visions of NSD. It would therefore be an advantage to select the one of the two remaining assignments that is closest to this, so as to be able to relate the students' activity to the activity the producer had pictured. Assignment number 1 in 'Racism' does not resemble the pattern. In addition, the assignment atypically requests a series of frequency-distributions, instead of a cross-tabulation. Assignment number 1 in 'The UN and Norway', however, is built on the pattern, and is therefore a natural choice for interaction analysis.

9.4 Interaction Analysis

Figure 12 shows assignment number 1 in 'The UN and Norway' in context.

Figure 12: Explore Data assignments in 'The UN and Norway' (My translation)



The screenshot shows the S-VEV website interface. At the top, there is a navigation bar with links for 'CHOOSE NYNORSK', 'TEACHER'S WEB', 'ABOUT S-VEV', and 'SEARCH:'. Below this is a secondary navigation bar with tabs for 'Citizenship', 'NSDstat for Web', 'Data Resources', 'Own Inquiries', and 'Web Forum'. The main content area is titled 'The UN and Norway – a love story?' and includes a breadcrumb trail: 'You are here: Citizenship > The International Community > UN and Norway – a love story?'. The page is paginated, showing 'PAGE 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | All'. Below the title, there is a section for 'EXPLORE DATA' with a sub-header 'EXPLORE DATA' and a description: 'You can now continue to work with the data set *World Values Survey 1995 – Confidence in NSDstat for Web.*'. The assignment text reads: '1. In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India or Russia. Give grounds for why you believe the confidence is particularly great in this country. That is called making a hypothesis or an assumption about a relation. Check the hypothesis by making a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable.' A link is provided: 'Open "World Values Survey 1995 – Confidence" in NSDstat for Web'. A second question is partially visible: '2. Make a cross tabulation where you use PARLIAMENT as dependent variable and COUNTRY as independent variable. Compare this table with the one you made in assignment number 1. Can we say that the UN enjoys great confidence among people in'.

The wording of assignment number 1 is:

1. In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India or Russia. Give grounds for why you believe the confidence is particularly great in this country. That is called making a hypothesis or an assumption about a relation. Check the hypothesis by making a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable.

The analysis relates to a transcription of the students' work. The transcript is continuous, but is broken up at timely places, to make room for analytic comments. To benefit the reader the text is supplied with subheadings, indicating what is most salient in different parts of the running analysis.

Knowing how to approach the assignment

Ivar¹³ is the first one who is ready to begin the work. For a couple of minutes he has been reading the assignment text (with his cursor successively and repeatedly highlighting sentences). He then copies text from the assignment and pastes into the personal document, before he calls upon the others to move onto the assignment (for an explanation of transcription conventions see the Appendix):

#	Name	Utterances	Actions
1.	Ivar:	<We'll take the first assignment, right?>	#45.15 <Copies assignment number 1 from the S-vev and pastes into personal document>
2.	Paal:	<Do you remember it, now?>	<Turned to Ulf>
3.	Ulf:	<Yes.>	<Looks at his screen while transcribing Paal's written answer to a task before the Explore Data section>
4.	Paal:	<>	<Leaves the document that Ulf transcribes from, and switches to his personal document>

¹³ The names of the students are pseudonyms.

- | | | | |
|-----|-------|--|--|
| 5. | Ivar: | <p><Huh?> <'In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India or Russ--. Give grounds for a why you believe the confidence is particularly great in this country. That is called making a hypothesis or a prediction about a relation.'></p> <p><(8s)> Hypothesis. (1s) What are we going to say?=Who do we believe has the greatest confidence in the UN? (3s) Norway, do they have great confidence in the UN?</p> | <p><Keeps eyes on screen></p> <p><Reads aloud the beginning of assignment number 1 from S-vev></p> <p><Types 'Hypothesis:' in his personal document></p> |
| 6. | Paal: | <p><Just wait a minute (.) just throw it in here.></p> | <p><Copies the entire assignment and pastes it into personal document. Deletes the two last sentences.></p> |
| 7. | Ivar: | <p>< ></p> | <p><Surfing an internet newspaper></p> |
| 8. | Ulf: | <p><That's it, yeah></p> <p>Then beginning with the questions below. < ></p> | <p><Finishing his written answer to task before the Explore Data section ></p> <p><Presses enter to make space in the personal document></p> |
| 9. | Ivar: | <p>Hypothesis.</p> | |
| 10. | Ulf: | <p><(6s)> What is the hypothesis, then?</p> | <p><Typing 'Questions:' in his personal document></p> |
| 11. | Ivar: | <p>Uhm. What do we believe? Where do we believe the confidence in the UN is greatest?</p> | |
| 12. | Paal: | <p>< ></p> | <p><Types 'Hypothesis:' in personal document, and folds his arms></p> |
| 13. | Ulf: | <p><Is it on ass- question 1 we are now? (1s) I'm lagging a little behind. Two seconds.></p> | <p>#46.41</p> <p><Copies the assignment and pastes it into his personal document></p> |

In the excerpt above, Ivar starts reading aloud from the beginning of assignment number 1, after having observed it silently for a while. This could be described by Jordan and Henderson's (1995) observation that events often have an official beginning, preceded by participants' verbal and nonverbal preparatory activities.

He does not read aloud the instructional sentence for doing a tabulation. This may attest to an understanding that they should complete some other activity before moving on to the tabulation. He types 'Hypothesis:' in his personal document, and seemingly reads this word aloud: 'Hypothesis. (1s) What are we going to say?=Who do we believe has the greatest confidence in the UN? (3s) Norway, do they have great confidence in the UN?' (Turn 5). Ivar seemingly interprets the assignment's call for a hypothesis as a call for written response. By writing

'hypothesis' followed by a colon, the personal document becomes a structuring resource in the activity, being a visible sign of a forthcoming written hypothesis.

He starts a discussion ('What are we going to say?'), and it is clear that the goal of the discussion is that they should have something 'to say' to in response to the call for a hypothesis. The others are not ready to start a discussion yet. Paal copies the assignment, and edits it in his personal document. Ulf finishes a written answer to a task before the Explore Data assignments. Once again, Ivar says 'Hypothesis' (turn 9). There is silence while Ulf types 'Questions:' (turn 10) on top of his personal document. Ulf then asks the others 'What is the hypothesis, then?' indicating that he is ready to discuss a common hypothesis. Ivar indicates that the hypothesis should be a joint venture by asking 'What do we believe?', and focuses his quest by saying 'Where do we believe the confidence in the UN is greatest?' (turn 11). Just like Ivar, Paal writes 'Hypothesis:' in his personal document, and folds his arms, indicating that the hypothesis should be discussed before it is written down (turn 12). By saying 'Is it on ass- question 1 we are now?' (turn 13), Ulf relates the current activity to the assignment. Then, by asking the others to wait until he is ready, he further demonstrates the making of a hypothesis as a joint activity. It is noteworthy that the assignment does not describe the work as group activity. The Norwegian word for 'you' used in the assignment is directed at second person singular.

At this point, all three students have copied text from the assignment and pasted into their personal document. Ulf has left the assignment text in its original form, while Paal has edited the pasted text as shown below. Ivar is about to do the same editing as Paal (turn 15 in subsequent excerpt). The italicised part of the assignment is deleted from Paal and Ivar's personal documents:

1. In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India, or Russia. Give grounds for why you believe the confidence is particularly great in this country. [*That is called making a hypothesis or an assumption about a relation. Check the hypothesis by making a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable.*]

The deletion of the two last sentences may testify to experience in what it means to 'make a hypothesis' and to 'check it'. Additionally, the students could be cultivating a question-and-answer format of the personal document, leaving out unnecessary information. In this regard, it can be mentioned that Paal had typed 'Assignments' for heading in his personal document before the 'official' start of their work. Likewise, Ulf had typed 'Questions' for heading.

Ivar and Paal's selective pasting of the assignment text can be interpreted as a step in the overall design of their personal documents for this Explore Data section. The pasting of the two first sentences may indicate that the following content of the personal documents will contain a response to these sentences. The character of the left-out sentences is different. The first left-out

sentence is an explanation, and does not ask for a response. The last left-out sentence is instructions for a table. If the table is pasted in the document, it will contain the information from the sentence, rendering the sentence itself superfluous. Thus, the selective pasting of the assignment text can so far be interpreted as an indication of what Ivar and Paal think will be relevant according to the overall design of their personal documents. The way they pasted and edited the assignment text without verbal negotiation bears witness of routine in their approach to the Explore Data assignments.

Restricting the discussion in order to first make a prediction

After Ivar has asked for a hypothesis the second time (turn 9), and all three are aware of which assignment they are working with (turn 13), Paal moves on to discuss which country has the greatest confidence in the UN:

14. Paal: =Probably those countries who are, like- have right of veto.
15. Ivar: <Of those, there?> <Looks at assignment he had pasted in the personal document. Deletes two last sentences of the assignment>
16. Paal: Yes, such as the USA, Russ--.
17. Ivar: No::, I don't think so, because like the USA, have a lot of debt to the UN, because they don't pay enough, right. It's not sure that they have so g--
18. Ulf: Know-- know what I think? I think it is those smaller countries--
19. Ivar: It is not Russia, either, because they-
20. Paal: They are surely [following] UN.
21. Ulf: No, but I think it's like- No, but. Listen. I think it is like those smaller countries. Because
22. Paal: Norway?
23. Ulf: they haven't. No, even smaller countries, because-
24. Paal: But it surely is <those>. <Pointing repeatedly at the screen>
25. Ulf: Yes, yes, but countries that- Oh, so it's those.
26. Ivar: But Norway is much involved in the UN.
27. Paal: Yes, I would-
28. Ivar: I would believe that Norway has great confidence-
29. Ulf: <> I would believe that eith- <Turns body, and leans towards the others>
30. Paal: Not the USA?
31. Ulf: No::

32. Ivar: I believe Norway first. < > <Moves hands to keyboard>
33. Ulf: Yes. < > <Moves hands to keyboard>
34. Paal: Then Australia. < > <Moves hands to keyboard>
35. Ulf: I agree with that. (.) I agree with that.

Paal opens the discussion¹⁴ by indicating that he thinks countries with veto (plausibly in the Security Council) have great confidence in the UN (turn 14). Having veto in the Council is a *general characteristic* shared by five countries. Among the seven countries listed in the assignment, however, only USA and Russia represent veto powers. By looking at the assignment and responding ‘of those, there?’ (turn 15), Ivar shows an understanding that they should concentrate on the countries listed in the assignment, instead of including all veto powers in the discussion. The assignment is thus used as a resource in narrowing the discussion. Paal sustains attention to the general characteristic (turn 16) while listing the veto powers specified in the assignment. Ivar interrupts him to discuss one specific country in the assignment (turn 17), leaving the general focus.

Next, Ulf enters the discussion by suggesting that countries who share the *general characteristic* of being small have great confidence in the UN (turn 18). Paal focuses the discussion by suggesting Norway, which is the smallest country mentioned in the assignment (both in area and in number of inhabitants). Ulf responds ‘No, even smaller countries, because’ (turn 23), apparently still talking about a general characteristic, not specific countries. Paal stops Ulf’s reasoning by pointing at the screen and saying ‘But it surely is those’ (turn 24). The assignment on the screen is thus used as a resource to restrict the discussion from to particular countries. With Ulf’s response ‘Oh, so it’s those’, all three students have come to focus on the countries specified in the assignment.

The next turns (27-35) are all short, and some are not even full sentences. Concentrated interactional work is done here, as the students keep speaking all at once. The turns start with Paal’s ‘Yes, I would’ (turn 27). The two words ‘I would’ are parroted by Ivar and Ulf (turns 28 and 29). It is as if the students all know what is to be said now; that they recognise what they do now as a separate segment in the activity. Ivar’s utterance is the most complete sentence: ‘I would believe that Norway has great confidence-’ (turn 28). The utterance has seemingly used the assignment as a resource for its wording, as the assignment text says: ‘In which one of the following countries do you believe the confidence in the UN is the highest...’ Paal reassures ‘Not the USA?’ (turn 30), which is rejected by Ulf without reason. Ivar maintains that Norway is the first, concerning great confidence in the UN (turn 32), without further explanation. When Paal

¹⁴ The excerpts in the interaction analysis section are continuous. All verbal utterances in the work with assignment number 1 is presented, unless otherwise stated in the text. A few omissions are specified in the excerpts (for example ‘9 turns on Ulf’s formatting problems’).

suggests Australia in second place (turn 34), he shows that he adheres to Norway on first place. Ulf repeats that he agrees with that (turns 33 and 35). The type of interaction changes as all three move their hands to the keyboards, indicating a new segment in the activity.

Writing a hypothesis

Both Ivar and Ulf immediately start to write:

- | | | |
|-----------|--|---|
| 36. Ivar: | <u><></u> | <Writes 'I believe Norway has great confidence in' in personal document> |
| 37. Ulf: | <u><></u> | <Writes 'HYPOTHESIS' in personal document> |
| 38. Paal: | <Should we take 'I' or 'we'? Well>, <Ivar will of course take 'I'. Are we going to take 'we'?> | <Looks at Ivar's screen>
<Turned towards Ulf> |
| 39. Ulf: | We'll take 'we', we will. | |
| 40. Paal: | <Yes> | <Leans over and takes a look at Ulf's screen, starts to write> |
| 41. Ivar: | I can also take 'we'. <u><></u> | <Changes 'I' into 'We' in his personal document> |
| 42. Ulf: | <u>((Laughs)) <></u> | <Writes 'we believe that Norway'> |
| 43. Ivar: | <((A few inaudible words)) 'confidence in'> <> | <Mumbles what he has written>
<Writes 'the UN, because they have a lot to do'> |
| 44. Ulf: | <u>Norway has the greatest confidence, right?</u> | |
| 45. Paal: | <u><Why, WHY?></u> | <Turns to Ivar, and folds his arms> |
| 46. Ivar: | <u>'Has a lot to do with the UN, and the UN also has great confidence in Norway as a peace preserving nation. The vice general secretary of the UN is Norwegian Terje Rød Larsen.'</u> | <Quotes what he types in personal document> |
| 47. Ulf: | <u><></u> | <Transcribing the first sentence of Ivar's quote> |
| 48. Paal: | <u><></u> Is that necessary? To include such facts in there? | <Transcribes the first sentence of Ivar's quote> |
| 49. Ivar: | I just included it. And like- it means that Norway is high up in the UN system. | |
| 50. Ulf: | <> You know what I- I believe other countries actually are starting to get fed up with Norway always going to be mediator for peace. | <Finishes transcribing the first sentence of Ivar's quote. Removes hands from keyboard, and turns towards the others> |
| 51. Ivar: | Norway thinks- Norway is involved in everything.
<> | <Enters NSDstat for Web> |

Before starting to write, Paal ponders whether their collaboration should be reflected in the personal documents: ‘Should we take “I” or “we”?’ (Turn 38). Together they decide to voice their personal documents with ‘we’. The persona voicing the text is only important if someone else is going to read the document. A relevant observation in this regard, is that after each 2-hr period the teacher collected the personal document of an arbitrarily chosen student in class. The students’ knowledge that the teacher could be the reader of the text thus influences the content.

After changing the author voice from ‘I’ to ‘we’ (turn 41) in his document, Ivar mumbles what he already has written (turn 43). The mumbling shares his attentional focus on the document with the others, as he continues to write. By turn 43, the students have written the following:

Ivar: ‘We believe Norway has great confidence in the UN, because they have a lot to do [with the UN]’.

Paal: ‘We believe Norway has great confidence in the UN’.

Ulf: ‘We believe that Norway’.

Paal then calls out ‘Why, WHY?’ (turn 45). From Ivar’s response, it appears that he is asking for a reason for Norway’s supposed great confidence in the UN. Paal’s question does not appear casual, however, because of the loud voice. *Giving a reason* thus appears as a requirement in their work. In this regard, the assignment’s second sentence may be operating as a contextual resource: ‘Give grounds for why you believe the confidence is particularly great in this country.’

In the first part of the work, the students were impatient to agree on which country they thought had the highest confidence in the UN. They used the first sentence in the assignment as a resource for avoiding discussing *general reasons* for great confidence in the UN. When Paal calls for a reason at this point, it marks that they agreed on a country before agreeing on a reason. This resembles the order found in the two opening sentences of the assignment; the first asking ‘which country’ and the second prompting to ‘give grounds’. When the students implement this order in their work, they display a very literate or ‘assignment-like’ understanding of the two first assignment sentences.

Paal’s call for a reason (also found in the assignment) is answered in a very concrete way by Ivar. Ivar simply quotes what he is typing in his personal document. The assignment’s call to ‘give grounds’ is thus interpreted as a call for written response, like was the assignment’s first sentence: ‘In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India, or Russia.’

After his subheading ‘Hypothesis’, Ivar has now written the following:

We believe that Norway has great confidence in the UN, because they have a lot to do with the UN, and the UN also has great confidence in Norway as a peace-preserving nation. The vice general secretary of the UN is Norwegian Terje Rød Larsen.

The first sentence contains a prediction, and grounding for the prediction. The incorporation of reasons in the same sentence as the prediction may indicate that Ivar considers reasons to be part of what constitutes the hypothesis.

Ulf and Paal transcribe what Ivar is saying (turns 47-48), and thereby accepts his concrete way of interpreting how to ‘give grounds for why you believe the confidence is particularly great in this country’. Neither Paal nor Ulf transcribes the last sentence recited by Ivar: ‘The vice general secretary of the UN is Norwegian Terje Rød Larsen.’ Instead, Paal asks; ‘Is that necessary? To include such facts in there?’ Apparently, he sees this as outside the scope of their work. Ivar answers: ‘I just included it. And like- it means that Norway is high up in the UN system.’ (turn 49). Here, Ivar immediately modifies ‘I just included it’ by explaining that Norway is high up in the UN system. From this one might deduce that Norway’s position influences its confidence in the UN, and his ‘fact’ is thus rendered relevant to the assignment.

The moment Ulf finishes transcribing the first sentence of Ivar’s quote he goes on to an emotional remark on Norway’s role as mediator for peace (turn 50). The remark is not directly relevant to a strict interpretation of the assignment. He also leans back, and removes his hands from the keyboard. This signals that he has finished the written hypothesis. Ivar responds to Ulf (turn 51), and then moves from hypothesis writing to table generation in NSDstat for Web.

Generating a table

The following shows a new segment in the activity transpiring.

- | | | | |
|-----|------------|--|---|
| - | [12 turns] | [Ulf and a student outside the group talk about Norway always being mediator] | |
| 52. | Ulf: | < > | <Turns towards the screen, and corrects a misspelling indicated by Word> |
| 53. | Paal: | Can we write that we believe <i>Norway</i> has greatest confidence, or the <i>inhabitants</i> of Norway? | ((Paal has been idle, looking at his personal document, since his last turn)) |
| 54. | Ulf: | <What’s up? What’s up, now?> | <Leans over, and looks at Paal’s screen> |
| 55. | Ivar: | =Should we go on and-- < > | <Clicks ‘Result’ button in NSDstat for Web. Table appears> |
| 56. | Ulf: | <u>No, we’ll take <i>Norway</i>.</u> | |
| 57. | Ivar: | <u>Nigeria it was</u> , that had the greatest. Norway is far <u>down</u> . | |
| 58. | Ulf: | <u>Hey</u> , where was it you people=Where was it you entered, <Ivar?> | <Switches from personal document to web browser> |

59. Paal: < > <Deletes word 'inhabitants' from personal document>
60. Ivar: That one, below the assignment. There it says 'Open something'
61. Other: O::h, Norway sure is *right* behind Nigeria. Hey. You.
62. Ulf: < > <Which was- Which-> <Enters NSDstat for Web>
<Scrolls variable list>
63. Ivar: *What?*
64. Ulf: 'Country', right? <Selects 'Country' from variable list>
65. Paal: <HUSH> #50.08 <Turned to other student. Then starts to look at the table on Ivar's screen>

As mentioned, Ivar has entered NSDstat for Web (in turn 51) just before the excerpt above started. Ulf, however, does not yet have a task focus. As seen in the current excerpt, he is talking with a student outside the group about Norway always being mediator for peace. In turn 52 he once again has a task focus, by editing his written answer in the personal document. Paal, on his side, demonstrates a task focus by asking about details in the wording of their written answer (turn 53).

Now that both of his co-workers share a task focus, Ivar proposes that they should move on: 'Should we go on and--' (turn 55). At the same time, he clicks the 'Result' button in NSDstat for Web, and the table specified in the assignment appears. He comments what he sees in the table, by saying: 'Nigeria it was, that had the greatest. Norway is far down.' (turn 57). What he makes out of the table can be understood in relation to their hypothesis that Norway will have the highest confidence in the UN. He notes that the highest confidence was actually held by Nigeria, whereas Norway was far down.

Ulf seems eager to keep up, as he overlaps Ivar's comment by asking: 'Hey, where was it you people=Where was it you entered, Ivar?' (turn 58). By first addressing the question to 'you people', he portrays entering NSDstat for Web as an intrinsically shared conduct, or an identifiable segment of their forthcoming work. He then focuses his address to Ivar, as Paal has not yet entered NSDstat for Web. Before finishing the utterance, he switches windows from the personal document to S-vev, further proving that he is eager to keep up. This detail, however, provides added understanding of why he asked in the first place. Since he was not in S-vev when beginning his question, the question was not brought about by trouble in finding NSDstat for Web. Furthermore, he surely has entered NSDstat for Web many times before. Thus, the reason for asking seems to be that he wanted the others to wait for him, before they all proceeded to an interpretation of the table (that Ivar started in the turn that Ulf overlapped with his question).

Throughout the following turns, Ulf works to generate the same table as Ivar. He did not take the time to read the instructions in the assignment, rather he asks the others which variables to use (turns 62 and 64). Notably, Paal does not yet enter NSDstat for Web. He does not need to hurry, because his seating next to Ivar enables him to look at Ivar's table (which he starts to do in turn 65).

Seeing something relevant in the table

The student from a neighbouring group, who earlier discussed Norway's role as mediator with Ulf, enters the discussion once more. He takes up the discussion Ivar started when he said Nigeria had the highest confidence in the UN (recall turn 57). The student butts in while Ivar is speaking (turn 60) by saying in a loud voice: 'O::h, Norway sure is right behind Nigeria. Hey. You.' (turn 61). Ivar responds by saying 'What?' (turn 63). Paal, on his side, responds by saying 'HUSH' to the other student in a loud and commanding tone (turn 64). Ivar and Paal's responses can be a result of rejection of the other student's analysis. After all, the other student's observation of Norway being right behind Nigeria (concerning confidence in the UN) is not in harmony with Ivar's first observation of Norway being far below Nigeria (recall turn 57). An alternative interpretation of Paal's loud hush is that the other student distorts the group's organisation of their work with the assignment.

The other student's claim that Norway is right behind Nigeria (instead of far down) influences the further interaction, with Ivar first responding:

- | | | | |
|-----|-----------|--|---|
| 66. | Ivar: | ((Slightly raised voice:)) Well, Nigeria has 38.7%. | |
| 67. | Other: | ((Slightly raised voice:)) Yes, but add 'great' and 'fairly great confidence', then, Ivar. | |
| 68. | Ivar: | ((Slightly raised voice:)) Ye::s. | |
| - | [9 turns] | [Ulf has confused the dependent and the independent variable in his tabulation, and gets help from the Ivar, Paal, and the other student to rearrange the variables] | |
| 69. | Paal: | < > | <Enters NSDstat for Web> |
| 70. | Ulf: | =U::h, it is <Nigeria> that has the greatest confidence, for sure. <Norway> is <u>much further down, Ivar.</u> | <Holds mouse pointer over Nigeria column>
<Holds mouse pointer over Norway column> |
| 71. | Other: | <u>Yes, Norway is</u> in second place. | |
| 72. | Ivar: | < > But Norway <u>has a high 'fairly great confidence'</u> . | <Copies table from web page> |
| 73. | Ulf: | Norway is not in second place. | |
| 74. | Other: | Huh? | |
| 75. | Ulf: | Norway is not in <u>second place.</u> | |
| 76. | Ivar: | <u>Yeah, but</u> Norway has very <u>'fairly great'</u> . | |

77.	Other:	<u>'fairly great confidence'</u> , right.	
78.	Ulf:	What did you say, Ivar?	
79.	Ivar:	It is as [name of other student] says, 'fairly great' and 'great confidence' together.	<Pastes table into personal document>
80.	Ulf:	Aha, in that way, yeah. It is- it is.	
81.	Paal:	< > Do you <i>have</i> to have cross-tabulation. < >	<Scrolls down to the single variable list> <Clicks the 'Add variable' button, and a second variable list appears. Selects variables and clicks 'Result' button. Table appears>
82.	Ivar:	<u>Now we're saying that <'Here we see that Nigeria'>, we first say. < ></u>	#51.00 <Quotes what he types> <Continues to type>

On a general level, the discussion in this excerpt can be understood as a *ranking* of countries with the *highest* confidence in the UN. This is in line with the edited assignment text in the students' documents: 'In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India, or Russia. Give grounds for why you believe the confidence is particularly great in this country.' More specifically, it is the first of the two sentences that appears to be relevant to the discussion in the transcript excerpt above. The ranking logic can be seen in utterances pointing out: Nigeria as having the *greatest confidence* (turn 70), and Norway being *further down* (same turn), or being in *second place* (turns 71, 73, and 75). The special interest in Norway can be understood in relation to their hypothesis that *Norway* will have *the highest* confidence in the UN.

The table in the students' discussion distributes the countries' confidence in four categories: great confidence, fairly great confidence, not so great confidence, and no confidence. The categories form a polarised scale, where two categories are positive, and two negative. Based on this, several ways of having confidence in the UN can be thought of. Two ways are dominant in this excerpt.

In the opening of the excerpt, Ivar responds to the other student by stating Nigeria's score in the 'great confidence' category (turn 66). This way Ivar defines a country's great confidence by high score in the 'great confidence' category. The other student, however, follows up by saying: 'Yes, but add "great" and "fairly great confidence", then, Ivar.' (turn 67). This way a country's great confidence is defined by adding both positive categories: 'great' and 'fairly great confidence'. Defined in the first way, Norway is far down the rank. Whereas defined the other way, Norway is second in rank, almost levelling with Nigeria.

By turn 72, it is clear that Ivar has adopted the other student's way of defining great confidence. Ulf does not recognise this definition until Ivar states it clearly in turn 79, upon which Ulf responds: 'Aha, in that way, yeah. It is- it is.' (turn 80).

Pasting the table, and making a comment

Following Ulf's acceptance, Ivar thinks they should make a written answer: 'Now we're saying that "Here we see that Nigeria", we first say.' (turn 82). From Ivar's utterance, it is clear he speaks for the group. Furthermore, he types 'Here we see that Nigeria' at the same time as speaking it aloud. He does not negotiate whether they should make a written answer, but treats it as a matter of course. In addition, he takes the role of formulating the wording without negotiation.

When Ivar moves so suddenly into a written response, this may indicate that he has interpreted the previous discussion as 'implicitly' about the content of the (following) written answer. It seems that Ivar follows a routine, and identifies the written response as a standard and separate segment.

Like with Ivar's sudden initiation of a written response, the subsequent turn marks another action that has not been negotiated (see excerpt below). Here, Ulf tries to select the table in NSDstat for Web (turn 83), which starts the process of copying and pasting the table into the personal document (turn 85). Ivar has already done this, without notice (earlier turns 72 and 79). Neither the Teacher's Plan nor the assignment has instructions to paste the table. Pasting or writing has not been negotiated in the previous interaction of the period (the co-text). Like with the written answer, the pasting of the table into a personal document seems to be routine. In other words, the students' unanimous acting indicates a common background resource in their work, influencing both the work and the segmentation of work. (This impression is further pursued in the interview.)

83. Ulf:	<=Hey, you. Why can't you select it, now huh? Why can't you select it?>	<Moves mouse pointer in a table cell with no content, thus the pointer shows as an 'arrow' pointer instead of a 'text select' pointer>
- 9 turns	[Ulf asks Paal about formatting problems]	
84. Paal:	<> Russia has more, Russia surely has more 'great confidence'. <>	<Copies table and pastes it in personal document> <Looks at Ivar's screen, then starts to type>
85. Ulf:	<>	<Copies table and pastes it in personal document>

Following Ulf, Paal copies the table and pastes it in the personal document (turn 84). Within the very same turn, he starts to type a written comment below the table. Before starting to write, he seemingly checks what Ivar has written by glancing at Ivar's screen. From the later interaction (not supplied), it seems that Paal's utterance that 'Russia surely has more "great confidence" ' is

not a disconnected observation about the table, but rather an input to the written comment. In the later interaction, Paal (inaccurately) calculates that Russia is right below Norway in rank if both 'great confidence' and 'fairly great confidence' is taken into account. He then states to the others that he has included Russia along with Norway in his written comment, upon which the others change their comments to include Russia, as well.

The way the written comments come into being is by Ivar reciting what he is writing. Unlike Ulf, Paal does not transcribe Ivar the first time he is reciting. Before Ivar is finished writing, Paal writes that Nigeria is on top, but stops typing, and looks at the screen, later to make oral comments about Russia's place in rank. Ulf consequently has to rely on Ivar's recitation. On Ulf's request, Ivar repeats what he has written. When Paal starts to write again, he occasionally looks at Ivar's screen. Ivar's comment is thus mediated orally and visually, causing that Paal and Ulf's comments contain the same information with only insignificant variations in wording.

The wording is also compared in the students' interaction. After Paal finished his written comment, Ivar monitored the comment by saying:

86. Ivar: =You say that the confidence is 'pretty great'. I say that it is 'very great'. (3s) When we got
87. Paal: =Yes. < > <Changes written answer>
88. Ivar: =70 percent.

Ivar remarks Paal's claim that the confidence in the UN in Norway is 'pretty great'. Paal's claim is not only describes the table, but also refers back to their prediction of Norway having great confidence. In this regard, the wording of the comment has increased import. Ivar uses the table as a resource to assess Paal's wording. When the table shows that the sum of the two positive categories 'great confidence' and 'fairly great confidence' is close to 70 percent, Ivar thinks this makes 'very great' confidence a better account.

A look at the students' personal documents

The interpretation of the excerpt above implies interdependence between various resources in the students' interaction. In their personal documents, the students have gathered and produced assignment text, a hypothesis, a table, and a comment. As the students now have finished their comments, it is time to display the resources in the personal documents together.

Below the heading 'Assignments', the students have pasted part of the assignment into their personal documents. Ivar and Paal only kept the two first sentences (excluding prescription for table), as shown below:

In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India, or Russia. Give grounds for why you believe the confidence is particularly great in this country.

After the pre-clause ‘Hypothesis:’ the students have made the following hypothesis (the last sentence was only present in Ivar’s hypothesis):

We believe that Norway has great confidence in the UN, because they have a lot to do with the UN, and the UN also has great confidence in Norway as a peace-preserving nation. The vice general secretary of the UN is Norwegian Terje Rød Larsen.

Below the hypothesis, the students have pasted the table prescribed by the assignment:

	USA	Mexico	Australia	Norway	Nigeria	India	Russia	Total
Great confidence	9,6	14,4	10,4	11,2	38,7	18,6	14,7	18,9
Fairly great conf.	40,3	37,0	40,0	62,2	35,0	36,8	46,3	41,2
Not so great conf.	36,5	24,1	38,0	24,0	18,1	27,1	25,6	27,2
No confidence	13,7	24,5	11,7	2,7	8,2	17,5	13,4	12,7
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
N=	1421	1487	1954	1110	2612	1060	1442	11086

In the end, the students made the following comment (Ivar’s wording):

Here we see that Nigeria clearly has the greatest confidence in the UN with its 38.7%, but if we look at fairly great confidence and great confidence together, Norway and Russia comes up at Nigeria’s level and we can really say that the confidence in Norway in the UN is very great.

The opening words of the comment, ‘Here we see that’, refer to the table right above in the students’ personal documents. With the words of the comment, the students first state what they ‘see’, and subsequently what they ‘can say’. This calls to mind the students’ words when they first read the assignment: ‘Hypothesis. (1s) What are we going to say?=Who do we believe has the greatest confidence in the UN? (3s) Norway, do they have great confidence in the UN?’ (turn 5). It was then clear that the students should have something ‘to say’ in response to the assignment’s call for a hypothesis. From the current wording of the comment, it is clear that they also should have something ‘to say’. In this regard, the assignment’s last sentence becomes relevant: ‘Check the hypothesis by making a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable.’ As we will see, the students seem to use the table for assessment, or ‘verification’, of the hypothesis in the comment.

The comment's first subordinate clause answers which country has the highest confidence in the UN (as the students were asked to predict in the assignment): 'Here we see that Nigeria clearly has the greatest confidence in the UN with its 38.7%'. As mentioned, Nigeria has the highest confidence under two definitions: highest percentage in the 'great confidence' category, and highest sum of the 'great confidence' and the 'fairly great confidence' categories. The second definition, however, gives Norway (the country they predicted had the highest confidence) a higher rank than would the first definition. The definition favouring Norway is included in the second subordinate clause: 'but if we look at fairly great confidence and great confidence together, Norway and Russia comes up at Nigeria's level'. The third and last subordinate clause can function as a positive assessment of their prediction of Norway being first in rank: 'we can really say that the confidence in Norway in the UN is very great.'

Notably, the comment is built on the ranking logic first found in the assignment, and later in their hypothesis. The ranking logic remains in their conversation after the comments are finished.

Immediately after Ivar is finished reciting the wording to Ulf, he continues with the following observation:

Now, we can see that 'no confidence' in Norway is only 2.7%, while in Russia it is 13.4%. Norway has clearly the least- that is, a minority that has no confidence in the UN. It is probably just communists and the like.

Additionally, Paal makes two similar observations. In the observations, rank is defined in yet another way: having *great confidence* in the UN may also be defined as having *least* 'no confidence'.

In the students' discussion and comment, only the *prediction part* of the hypothesis is assessed. The assessment does not include the prediction's *grounding*: 'because they have a lot to do with the UN, and the UN also has great confidence in Norway as a peace preserving nation'. The grounding asked for in the assignment is incorporated in the hypotheses, but not mentioned since.

The table is the basic resource in the assessment, and this evidently allows for a varied and advanced interpretation of the *rank focus* in the assignment and their prediction. The thorough assessment of their prediction makes the inattentiveness of the prediction's *grounding* stand out. The students used the table to 'verify' the prediction, but no resources can be distinguished to support 'verification' of the grounding part of the hypothesis. Tentatively, one may attribute the lack of attention to a lack of immediate resources. The rest of their work illustrates that their disregard of the grounding cannot readily be interpreted as result of low task focus.

Deciding that they have finished the assignment

When Ivar and Paal are finished exchanging observations about the table, and Paal has fine tuned his comment by stating Norway's confidence as 'very great' instead of 'pretty great' (turn 86), Ulf exclaims:

89. Ulf: <'File'>, <'Save'>. Why didn't it save that, huh? <Clicks File menu>
<Clicks 'Save as' command, 'Save' command is not visible in menu>
90. Ivar: < > ((Singing on a tune:)) All I want is love. <Switches to S-vev>
91. Ulf: Hey, here is something *insanely* wrong.
92. Paal: Are we going to go to the next one?
93. Ulf: <Now, I went up=Look here=And pressed 'save as', right.> I was going to save that thing-- in on that, the sheet. Right. Have a look now. Look what is happening now, right. <Clicks File menu, rests mouse pointer over 'save as' command>

Ulf's attempt to save the personal document shows the others that he has finished his comment. After this, Paal's suggestion to move on to the next assignment (turn 92) comes very quickly, showing a task focus. Ulf is not ready to move on, however. He overlaps Paal's turn with a request for Paal to look at his problem.

A few subsequent turns will be summarily described, without supplying transcription. Ivar shows that he is ready to move on by starting to read a newspaper article on the Web. Ulf and Paal discuss the problem for 6 more turns, when Ivar interrupts Ulf by asking: 'Are we going to start with the next assignment?' Without waiting for an answer, he switches windows to S-vev, and copies assignment number 2. By this, he is demonstrating a task focus, and a routine approach. Recall that he did the same thing for assignment number 1, when he copied and pasted while asking: 'We'll take the first assignment, right?' (turn 1).

Ulf does not take notice of Ivar's interruption, and continues to discuss the computer trouble with Paal. In the course of the 18 next turns (solely between Ulf and Paal) the tone moves from 'instrumental interaction' (Jordan & Henderson, 1995) to more social. When the trouble is solved, Paal smiles and calls Ulf clever in an ironic tone. Ulf smiles and tells Paal to watch it:

94. Ulf: ((Talks to Paal)) You shouldn't come too close now.
95. Ivar: < > Move on to the next assignment? Assignment 2? <Has finished formatting the pasted assignment text with a larger font size>

96. Paal: Yes.
97. Ulf: Yes.
98. Paal: It's about time.
99. Ulf: Assignment 2, right.
100. Ivar: Aha.
101. Ulf: <'Make a cross-tabulation with'> <Quotes assignment text>
102. Ivar: <'How great confidence have to the national-' 'Compare with-made in assignment 1'> <Quotes assignment text>

Ulf and Paal's social talk signals that the trouble is solved, and Ivar quickly repeats his proposal to move on (turn 95). Although he has already moved on himself, he finds it important that they all share attention to the task. Paal and Ulf say yes to move on (turns 96 and 97), and Paal supplies 'It's about time' (turn 98). The whole excerpt above can be interpreted as a display of commitment, and task focus. In the end of the excerpt Ulf and Ivar read aloud all at once from the next assignment (turns 101 and 102), bringing the work with assignment number 1 to a close.

9.5 Analysis of Interviews

The interview with the students

The interaction analysis shows that the students have a strong task focus. The students also seem to have a common understanding of different segments in their work. Some of this can be attributed to the design of the assignment. Some, however, must be attributed to background resources, from the students' prior experience. This can be seen in how the students do not have to negotiate *what* constitutes a new segment in their work, rather they negotiate *when* to start a new segment. Background resources must also account for how the students use the personal document. The student group interview, which was conducted after the interaction analysis had begun, was designed to find out more about the background resources.

Early in the interview, the students were asked what was important in their work:

103. Arngeir: [...] Do you remember what was the most important to you, when you were working? What you were working towards; what was the goal; what governed the course of the work?
104. Paal: T'was that we were going to present it, and like, throughout those pages, there were assignments all the way, right. That we had to go through and write down, and the like.
- 8 turns -
105. Ivar: Yes, so y- you could-- It wasn't very smart to take the chance that, 'No, we're not picked out this time', because then ((laughter))

106. Arngeir: ((laughter)) Because then you were exposed.
107. Ivar: Yes, then we would have heard it from more than one side.

The students here explain that they could be picked out to present their work, and that answers to the assignments are relevant to the presentation. This was confirmed by the observation in the classroom. During the course of every 2-hr period, it was common that the teacher picked out one group to present their work to the class. Ivar makes clear his concern for not being ready for a possible presentation (turn 105). If they made a poor presentation, they would hear it 'from more than one side' (turn 107), presumably both from the teacher and the class.

A few turns later Paal adds that:

And then, at some point, Geir [the teacher] made up a new method, as well. He started--like, he was going to point at one in the end of the period, and that person was going to print out everything he had written during the period, right.

Ivar complements:

Yes, it could be quite shocking. So, if one took the chance that 'Yes, the others in the group do; so I don't need to write it', and then, suddenly 'Yes, now you can print out', and then; almost nothing. And then you maybe got feedback, right, maybe next period, or the week after, right.

Ivar later explains an episode where he had almost written nothing, and the teacher picked him. Such episodes should be avoided, because they can be 'quite shocking'.

The students' awareness of a possible presentation provides a better understanding of their attention to having something 'to say' when writing their hypothesis, and their comment.

Video review session during the interview

The interaction analysis indicated that the students treated hypothesis writing and comment writing as separate segments in their work. To pursue this impression in the interview, a three-minute passage from their work was selected for a video review session. The passage is from the beginning of the work with the first assignment in the Plan of Work 'Racism' (to avoid confusion: later use of 'assignment number 1' will refer to the work analysed in the interaction analysis). Although the assignment does not ask for a hypothesis or a comment, the students refer to these concepts. Ulf calls for a 'hypothesis-thing', and during the course of the work, Paal proposes a hypothesis. Ivar immediately calls for a comment, and in the end, they all make one. Exactly because the assignment does not mention hypothesis or comment, this video passage can make the students talk about which background resources are at work.

The following conversation takes place after the clip had been presented.

108. Arngeir: I wonder a bit about precisely those things, then. Ehm, I don't know where to start. 'Comment', for example.
109. Paal: When we find such tables, then, we're always to comment. Comment what--
110. Ivar: what--
111. Paal: like, why we believe it is like that.
112. Ivar: And what the answer turned out to be after we--
113. Paal: Yes, yes.
114. Ivar: Yes, it depends what we knew beforehand.
115. Paal: Yes, first... first of all we're to have a hypothesis.
116. Ivar: Yes.
117. Paal: What we believe will happen.
118. Arngeir: Aha.
119. Paal: We write down that we're going to do that analysis, and then we write for example that we believe that group stands out the most, or they have the strongest opinion on this or that. And then we insert the table and then we comment it below, so that we have everything in Word. So that we first have the hypothesis, then we have pasted the table, and then, the comment below.

The excerpt reveals the students' general understanding of the work with the Explore Data assignments. The phrase 'When we find such tables, then, we're always to comment' (turn 109) shows that Paal is not only talking about what happened in the video segment they just watched, but is talking about their work in general.

The interviewer question makes it clear that several terms are of interest, but suggests starting with the concept of commenting. When the students explain different segments in their work, they do it by relating them to each other. They explain how the segments are related, and that they should be undertaken in a certain order. In the end of Paal's last turn, he sums up how the personal documents should look: '...so that we first have the hypothesis, then we have pasted the table, and then, the comment below.' (turn 119).

One of the terms mentioned by the students is hypothesis: 'Yes, first... first of all we're to have a hypothesis.' (turn 115). The hypothesis is immediately explained by; 'What we believe will happen.' (turn 117). Believing and hypothesising are aligned (whereas the motive or reason for believing is not mentioned). Tentatively, the last turn can also be seen to align prediction and hypothesis: '...We write for example that we believe that group stands out the most, or they have the strongest opinion on this or that. ...[W]e first have the hypothesis' (turn 119). The table in turn provides an answer relevant to the hypothesis: 'what the answer turned out to be after we...' (turn

112). The answer should then be elaborated in a comment. Interestingly, Paal states that the comment should *ground* why the result is as it is: ‘When we find such tables, then, we’re always to comment. Comment what, like, why we believe it is like that.’ (turns 109 and 111 together). The comment they made in assignment number 1, however, had no such *grounding*. In the interaction analysis, the table supported an advanced discussion of the *prediction* part of the hypothesis, whereas it was not observed to support the *grounding* part of the hypothesis. Here, in the interview, the students explain ‘hypothesis’ as a *prediction*, they do not mention *grounding* as part of the ‘hypothesis’.

The identification and ordering of segments that the students display here, were also seen in their work with assignment number 1 (in the interaction analysis). The understanding that the students display in the interview, can thus have functioned as background resources in their work.

The teacher interview

In the interview with the teacher a theme was what the teacher thought had been important in the education.

120. Argeir: What did you emphasise to the students as important in the way they should work? Now, I did u::h see in the material that the education has different parts with different focuses. Seen overall, what are the important things you were focusing on?
- 6 turns [Teacher is answering the question. Interviewer breaks in with ‘Mm’, ‘Mhm’ and ‘Yes’]
121. Geir: [That] they had a definite *method* for how to put the matters forward. It was exactly the same as they struggle with all other places. That was what I saw as the most important.
122. Argeir: Yes. What was it about, this method? Or how did you explain--
123. Geir: No, I had to explain that they had to look for the factual matters, to pull out the factual matters, and that they had to come to grips with making a... choosing a topic, explaining a problem statem... make a hypothesis, make a problem statement, and try to answer the problem statement, and see if they maybe, see if they maybe got their hypothesis falsified, or verified, and see if they maybe could answer why it was like that, why the correlation they had acquired was the way it was.

In the excerpt, the teacher says that he among other things explained to the students; how to make a hypothesis, to see if they could get their hypothesis falsified or verified, and to answer why the correlation they had acquired was the way it was. The talk of a correlation plausibly refers to the students’ generation of tabulations in NSDstat for Web. As can be seen from the excerpt, the teacher spoke of the conducts as part of a definite method. The method was later in the interview put across by the teacher as central in the citizenship subject in general. The conducts in the teacher’s explanation are similar to conducts that the literature review identified as frequently purported by textbooks in citizenship:

There are explanations of the inquiry process in most Social Studies/Social Science textbooks ... with the essential tenet being that there is a sequence of activities to guide students through a meaningful social investigation. Although there are a number of different ways of classifying this sequence it basically revolves around a progression of framing and focusing questions; locating, organising and analysing evidence; evaluating, synthesising and reporting conclusions; possibly taking action of some sort; and reconsidering consequences and outcomes of each of the above phases (Reynolds, 2001, pp. 20-21)

A characteristic of the teacher's explanation is its broad perspective, where students themselves define and navigate through the problem area. The students' method, to the contrary, seems to be about practical requirements of their work: what they should do, in which order, and what their personal documents should look like. The teacher's method seems to resemble that of social science research, starting already at choosing a topic. However, the analyses have shown that the nature of the Explore Data assignments is too structuring on the activity to allow the students to choose the topic or to formulate a problem statement freely.

9.6 Discussion

The following will discuss findings in the analysis for the sixth-form college. The analysis is the first out of two analyses in Phase II. The research question in Phase II has been:

What characterises the students' interaction during the work with the Explore Data assignments, and which resources are used in the interaction?

According to Jordan and Henderson (1995), events often have an official beginning, preceded by participants' verbal and nonverbal preparatory activities. In the students' work, Ivar had prepared the work with assignment number one by repeatedly reading the assignment text. He then copied and pasted the text into his personal document, before calling upon the others to move onto the assignment. The work was officially started when Ivar read aloud the beginning of the assignment text. Ivar delayed the official start until the others were ready. Later in their work, as well, Ivar was seen to wait for the others. The rhythm of activity (*ibid.*) was dependent on whether everyone participated. This way of organising the interaction was more outspoken in the work with another assignment. Here, the others scolded Ivar when they found out that he had started earlier.

The participation structure (*ibid.*) within the group has the general characteristic that Ivar is ahead in the work, Paal is a bit behind and Ulf is last. The spatial organisation (*ibid.*) of the site and of the work may play a role in this participation structure. The students sat in a line, with individual computers. When Ivar typed something, Paal could lean back and see it on Ivar's screen, whereas Ulf could only see Paal's screen. Paal was able to catch quickly up with Ivar, and did not always

start writing at the same time as Ivar. Consequently, Ulf had to rely on Ivar's recitation of his text until Paal had started to write. Because of small partition walls between the monitors, the students did not catch sight of the others' screens unless they leaned slightly back. This probably entailed that much of the talk was coordination of where each of the students were in his work, and of what had been written.

The screens were important artefacts (ibid.) in the interaction. Some of the information wandered from Ivar's screen, via Paal's screen, before finally appearing on Ulf's screen. The personal documents were important artefacts, as well. For example, when students wrote subheadings in the personal documents, the documents functioned as structuring resources in the activity, being a visible sign of forthcoming written text.

Jordan and Henderson (1995) state that segmentation of events is much about how people 'announce' that a segment boundary is reached. For example, students could be seen to move their hands almost simultaneously to the keyboards, silently announcing a new segment in the activity. Such transitions between segments happened smoothly in the students' work. Thus, the students seemed to know what constituted segments, with a minimum of negotiation. The smooth transitions between segments bear witness of a strong task focus, coordinating and keeping up the students' collective attention.

Jordan and Henderson note that activity sequences often have routinising aspects. The students' unanimous acting indicates a common background resource in their work, influencing both the work and the segmentation of work. In the interview the students talk of typical activities in working with an assignment. These activities were similar to the ones segmented by the students in their work with assignment number one.

According to Jordan and Henderson, trouble can reveal some of the background assumptions that often are taken for granted in interaction. There was little trouble in the students' coordination of their work with the assignment. In the work with another assignment, however, there was much trouble, briefly described in the overall description of the students' work. The particular assignment asked for uncommon operations, and unusually, it did not ask for a hypothesis. In the face of this, the students still asked: 'Don't we need such a hypothesis thing?' It took several minutes before they gained understanding of the assignment. This adds to the impression that the students had a common way of approaching assignments.

The assignment in the interaction analysis was more typical, asking for a hypothesis, giving instructions for a table and asking to use the table to check the hypothesis. The lack of explication and the tacit coordination and segmentation in the students' work with this assignment indicate that the students have a background understanding of this type of assignment.

The interview indicated that they did. Grounded in how the personal documents should look, this understanding was summed up by: '...so that we first have the hypothesis, then we have pasted the

table, and then, the comment below.’ The students explain how the segments are related, and that they should have a certain order. This background understanding may not have been developed simply out of a common structure in the assignments. The teacher says in interview that he had explained to the students; how to make a hypothesis, to see if they could get their hypothesis falsified or verified, and to answer why the correlation they had acquired was the way it was.

In class the teacher was seen to push the activity forward according to the Teacher’s Plan. The time pressure may have led to a greater focus on product. Kupperman, Wallace and Bos (1997) also associated product-orientation with time pressure in their study of ninth graders’ use of a shared database in an internet research project. Moreover, Scardamelia, Bereiter and Lamon (1994) have noted that in schools understanding is often undercut by an emphasis on the completion of a task or the creation of a product. Such emphasis was present in the current setting. For example, the teacher used to collect the personal document of an arbitrarily chosen student after each 2-hr period.

The interaction action analysis suggested that the students’ interaction was much about negotiating what they should ‘say’ in their personal documents, and coordination of saying it. The study of Lindwall and Bernhard (forthcoming) that was presented earlier had a comparable scenario with students working in a laboratory with probeware and associated assignments. In their study, as well, the students were concerned about the outcome of their work, namely the lab-report. Sometimes the report became more important than following all the instructions in the assignments. For example, assignments asked the students to make a prediction of a graph before they the graph was presented to them. Some of the students skipped making a prediction in advance, and instead passed off the presented graph as their own prediction. This could be done because the prediction, or lack thereof, did not influence the further work.

As regards the sixth-form students, they did follow instructions in their assignment, but in a strict manner. They did not elaborate their prediction, and used formulations from the assignment text as resources in restricting the discussion on the prediction. Like with the other case, the prediction would not influence which graph or table was presented to them in the next run. The prediction was not agreed upon first, and later documented in the personal documents. Rather, the typing in the documents functioned as a resource in making the prediction. The activity was product-oriented. The rationality of the students seemed to be on the quality of and completion of the personal documents. Knowledge-orientation in the activity was fitted in with this rationality.

Likewise, Kupperman et al. (1997) found that the students in their study were focused on getting their task done. A main part of the data was video output from the computer merged with audio recording of the students’ conversations. This was analysed for patterns in the activity and for evidence of the students’ attitude toward the computer tool. The researchers found that, despite the *potential* for knowledge-sharing, neither the computer tool nor the group assignment in itself seemed to facilitate knowledge-oriented actions. The few knowledge-oriented actions observed

were idiosyncratic and unplanned. The researchers attribute their findings to the school's culture and priorities. Thus, it is not only the affordances of the tool and the assignment that is important, but also the wider culture.

The current study along with Lindwall and Bernhard's study indicate that the link between different parts of the work with an assignment is important. The earlier parts of the work should have consequences for the later parts. The study of Kupperman et al. (1997) add to an emphasis that it is not sufficient that tools and assignments enable student inquiry, the wider schooling activity must also support such activity.

In chapter 11 the analysis above will be related to the analysis in Phase I.

10. ANALYSIS FOR THE TECHNICAL COLLEGE

The technical college was situated in a rural area. The class in question was specialising in ICT technical services maintenance. Their citizenship teacher had been on S-vev course at NSD, and they were going to use S-vev for first time in week 10, 2001. The observation took place two days. The video recordings started the second day, referred to later as the Block Day.

The class had not worked in groups in the previous activities in the citizenship subject. During the initial observations the first day, some students chose to collaborate in groups, and some students worked individually. The observations showed that some students spent much of the time on personal activities such as surfing the web, and using SMS or email services. A couple of groups distinguished themselves by having a high degree of interaction. The group was selected in company with the teacher based on which group would most likely have a high degree of interaction, and additionally concentrate on the work with S-vev.

10.1 Setting of the Students' Work

In the following the setting is described; the time before and after the work with the Explore Data assignments, and the resources around the students during their work.

The first day

The first day began with two citizenship periods. The class met in an ordinary classroom and the teacher handed out a sheet with a list of statistical terms and list of what the students were going to do. Then the students were informed about the research study for a few minutes. The teacher then explained basic statistical terms: Entities, variables, categories/values, frequency-distribution, relative frequency-distribution, bar chart, cross-tabulation, independent and dependent variables. Next, a list of task for the work with S-vev was read aloud. The two first tasks were instructions on how to navigate to the right Plan of Work, and the last task concerned the work:

Read the texts, and complete the assignments for this Plan of Work. Make notes in keyword style on each assignment, we sum up orally tomorrow (Wednesday). In the assignments where you are going to use NSDstat, you can cut and paste the tables you make into Word. Make a printout, and bring this Wednesday.

As seen in the quote, the students were told to file their answers to S-vev assignments in a digital document. The objective of the document was presented as a joint teacher-student platform for a later class discussion. The periods continued in a computer lab, where the students started to work with the Plan of Work 'Cultures Collides'.

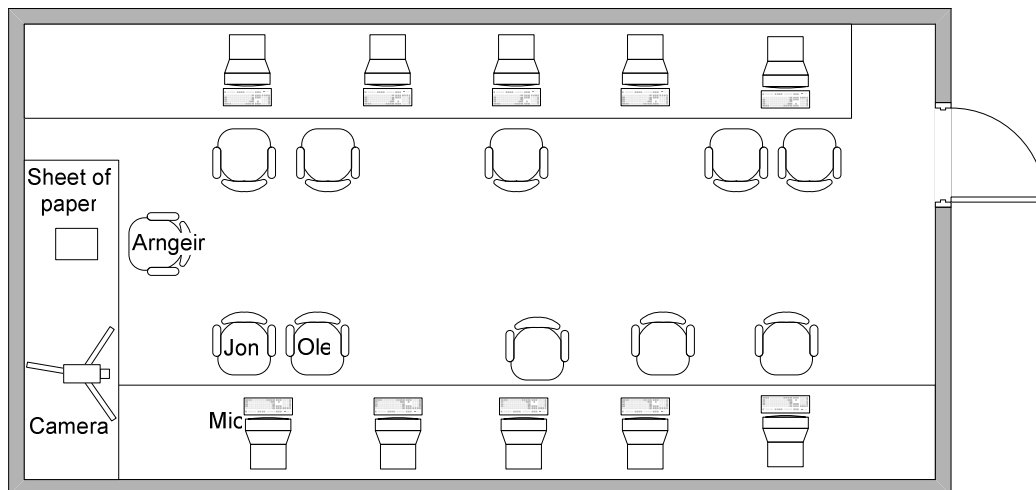
The 'block day'

The next day was called a 'block day' because it consisted entirely of one block of eight citizenship periods. The day began in an ordinary classroom. The teacher handed out a task list for the day, and the video recordings started. First, the teacher started a discussion with the class about what they thought about working with S-vev. The day before, some students (not members of the selected group) had started to solve Explore Data assignments, and the teacher moved the discussion on to talk about the results of the themes in the forthcoming Explore Data assignment.

After the discussion the class went to a computer lab to continue the work with S-vev and the Explore Data assignments. Since there were not enough computers for all students, a few students including the selected group had to share one computer. Following two periods of S-vev work was an announced session in the ordinary classroom where the answers to the Explore Data assignments were discussed. This session concluded the S-vev related work on the block day.

Physical arrangements

Figure 13: Physical arrangements at the technical college



The computer lab was a narrow room with about five computers along each sidewall. There was no blackboard or teacher's desk, so the teacher walked around, and sat down with the groups that needed help. The selected group shared one computer in the end of one of the sidewall, and there was some distance to the next group. Jon sat on the right side of the keyboard, and could operate both the mouse and the keyboard. Ole could only reach the keyboard. The chairs were not swivel chairs, and the students' bodily orientation was in a sense fixed towards the computer. The camera captured the students' interaction from the side. I was seated about two metres from the group, oriented towards a sheet of paper for notes. A small microphone for the mini-disc recorder was placed behind the keyboard.

The Teacher's Plan

The teacher began each of the two days by handing out a sheet listing and ordering what should be done. The sheets are subsequently referred to as the Teacher's Plan. The excerpt below is the Teacher's Plan for the students' work with S-vev on the Block Day. The students had the Teacher's Plan available on their desk during the work with S-vev. An excerpt of the Teacher's Plan is presented below (my translation, formatting kept as in original).

Excerpt 10: The part of the Teacher's Plan for the Block Day concerning the work with S-vev

CITIZENSHIP BLOCK DAY 6th of March

1. Sum up of the results from yesterday. (above) How was it to work with S-vev?
2. **2nd, 3rd and 4th period: work with S-vev**
3. First, finish the **assignments for the Plan of Work we were working with the yesterday** (Cultures collide). In the last assignment you are going to choose a factor that may influence attitude towards immigration. The assignment is going to be presented to the others in the end of the spell. We will split the work up like this: **[Name 1] and [Name 2]** will concentrate on the variable **AGE**, **[Name 3], [Name 4], and [Name 5]** will work with the variable **EDUCATION**, **[Name 6], and [Name 7]** will work with the variable **SOCIAL AND ECONOMIC STATUS**. **[Name 8] and [Name 9]** will work with the variable **PART OF THE COUNTRY**. **Jon and Ole** can choose one of the 4...
4. New theme is culture and religion. Enter **Cultural Competence** – and then **'In the name of the Father'**. Read the texts, solve the assignments along the way, and save your answers in Word. I want a print of your answers handed in on the end of this spell. It will be nice if you also save the tables you are commenting.

The group document

As mentioned during the presentation of the collected data, the students kept a record of their work with S-vev assignments in digital documents. The two students worked on the same computer and shared a group document for each Plan of Work in S-vev. The documents were printed, and handed in to the teacher.

10.2 Summary of the Students' Work

The students' work with all of the Explore Data assignments is summarised below. After this, the work with a single assignment will be selected for interaction analysis.

The work with the Explore Data assignments took place during a couple of periods in the Block Day, and involved Explore Data assignments from the two Plans of Work ‘Cultures collide’ and ‘In the name of the Father’.

The first assignment in ‘Cultures Collide’

Excerpt 11: Assignment number 1 in Plan of Work ‘Cultures Collide’

Now you are going to use the School Elections Inquiries from both 1999, and 2001 in NSDstat for Web.

1. Enter the School Elections Inquiry from 2001, and find out if the pattern from 1999 has changed. Use the variables *IMMIGRATION THREAT* as dependent variable and *SEX* as independent variable.

Open the School Elections Inquiry 2001 in NSDstat for web

Open the School Elections Inquiry 1999 in NSDstat for web

The two students, Jon and Ole, start the work with the assignment by immediately opening NSDstat for Web. Jon is uncertain about the variables, and prompts Ole. They generate the table, copy it to the group document and tag it with ‘1999’ to be able to tell the difference from the forthcoming 2001 table. Immediately after, they generate the second table, copy it to the group document, and tag the table with ‘2001’. With this they judge the entire Explore Data section finished. Jon asks the teacher if they are going to move on to an assignment referred in the Teacher’s Plan, because, as he says; ‘now we have written a lot of things’. The students discuss with the teacher which task they are going to do, and the teacher tells them to continue with assignment number 2 in the Explore Data section.

The second assignment in ‘Cultures Collide’

Excerpt 12: Assignment number 2 in Plan of Work ‘Cultures Collide’

2. Is there any relation between the attitude towards immigration and which party one sympathises with? Find out how the situation was in both 1999, and in 2001. Are the results approximately the same? Make a cross-tabulation between *IMMIGRATION THREAT* as dependent variable and *ELECTED PARTY SHORT* as independent variable.

The teacher initiates the work by asking them to enter NSDstat for Web, the 1999 inquiry. She helps them to pick the right variables and generate the first table, and tells them to do the same with the 2001 inquiry. The students generate three tabulations, and call for teacher several times. At one point the teacher initiates reflection on the 'relation between the attitude towards immigration and which party one sympathises with' by starting sentences that the students should finish: 'Do you remember what you were talking about [in earlier class discussion], that you meant that the Progress Party was...' The teacher 'walks through' the reflection with the students. The students do not contribute verbally, but Jon points with mouse at values in table as the teacher refer to the values.

The third assignment in 'Cultures Collide'

Excerpt 13: Assignment number 3 in Plan of Work 'Cultures Collide'

Based on these results; can one say that some parties have voters who are positive to immigration, while others have voters who are sceptical of immigration?

Jon reads aloud the assignment, and proposes an answer format by asking: 'Yes or no?' He then types a provisional answer in a typical school style of language: 'Based on my opinions I simply don't know', which is soon to be replaced by a simple 'Yes'. Both students make a few tries to initiate a discussion by referring to the table and assignment text, but soon Ole ends the discussion by saying: 'Oh, I'm looking forward to the weekend.'

Next, the students refer to the Teacher's Plan. They immediately call for the teacher, because they should choose one out of three variables, and it is not clear from the circumstances which one. The teacher gives them the variable 'social and economical status', and explains that they are not going to use the School Elections Inquiry, but another one (Linked below the assignment).

The fourth assignment in 'Cultures Collide'

Excerpt 14: Fourth assignment in Plan of Work 'Cultures Collide'

Many factors can be involved in determining which attitude one has towards immigration and immigrants. Four such factors can be age, level of education, social and economic status, and part of the country. Choose one of these four factors and give grounds for how you think the chosen factor relates to attitudes towards immigration and immigrants.

Now you are going to use the inquiry *Attitudes towards immigration – extract of Omnibus 1999*. The four factors above are found in this dataset as the variables AGE, EDUCATION,

SOCIAL AND ECONOMIC STATUS and PART OF COUNTRY.

Test the hypothesis you formulated above. Make three analyses; Use first SOCIAL SERVICES IMMIGRANTS, then EMPLOYMENT IMMIGRANTS, and finally CRIME IMMIGRANTS as dependent variable. For all three analyses you will use your chosen variable as independent variable. Based on these three analyses; can you say that you have found support for what you believed?

Open “Attitudes towards immigration – extract of Omnibus 1999” in NSDstat for web

The teacher has told them which three tabulations they should make. Jon moves straight to NSDstat for Web, then prompts for variables, then quotes a few words from the assignment with focus on variables, selects one variable, and prompts the teacher for the other. On request from the teacher, Jon formulates the hypothesis: ‘I believe that the immigrants are a “threat” to “industry workers”.’ The teacher says they should check afterwards if the hypothesis is correct. For half an hour the students try to modify a table that is too wide to fit into the group document, but solves the problem by changing the presentation format in NSDstat for Web to graphic. When last graphic is made, they call the teacher to show her they have made all three tabulations. The teacher asks if the statistical results were the way they believed. Ole tells her to wait, so he can look at the first graphic. Jon quotes the ‘Unskilled’ category in the graphic (their hypothesis was that immigrants would be a threat to unskilled workers). Ole identifies ‘Other self-employed’ category in graphic as most critical of immigrants access to social services. The teacher leaves, reflection stops, and the students express that they are finished. Jon formats Word document to make it look better (crops graphic, bolds hypothesis), prints it, and they move on to a new Plan of Work.

Before Explore Data in ‘In the name of the Father’

The students skip the reading matter of the Plan of Work, but work through most of the interactive tasks. At one point Jon spots the teacher taking notes on a paper, and asks her if she is writing marks. She says ‘I am writing an evaluation of what you have done the first periods today. How I think you have been working.’ Ole and Jon looks at each other, and Jon immediately shows her the sheets they just printed, and says aloud the names of the items there. He asks if she wants the sheets, and she does.

The first assignment in 'In the name of the Father'

Excerpt 15: Assignment 1 in Plan of Work 'In the name of the Father'

You will now continue to work with *Inquiry on Religion 1998* in NSDstat for web and examine whether religiousness plays a role in regard to which values and attitudes people hold.

Is it the most or the least religious who most agree that religion leads to more conflict than peace? Make a cross-tabulation where you use RELIGIOUSNESS as independent variable and RELIGION AND CONFLICT as dependent variable. Often it can be easier to spot the tendencies in the material if you produce graphics.

Open Inquiry on Religion 1998 in NSDstat for web

Jon says to the teacher that they are soon finished because they have reached page 5 (Explore Data). The teacher says they should copy the assignment texts into Word. Jon mumbles the assignment text, while reading aloud when he reaches the names of the variables. He enters NSDstat, chooses the first variable but gets help from the teacher on last variable, because the assignment had spelled it wrongly. He asks the teacher where in the group document he should paste the table, and the teacher says he will have to decide for himself.

The second assignment in 'In the name of the Father'

Excerpt 16: Assignment 2 in Plan of Work 'In the name of the Father'

In which way do you believe religiousness is related to attitudes towards gender roles? Make a cross-tabulation where you choose RELIGIOUSNESS as independent variable and GENDER ROLES as dependent variable. Was the relation as you believed?

Jon quotes the part of the assignment text that focus on variables. He makes space for the table in the group document, switches to NSDstat, finds that he has forgotten the variables, switches to Internet Explorer, quotes variable names, switches back to NSDstat, and the period ends.

10.3 Selection of Case for Interaction Analysis

Phase II of this study concerns students' interaction during their work with Explore Data assignments. The students in the selected group worked with two Plans of Work, and solved

Explore Data assignments in both. They started to work with the Plan of Work ‘Cultures Collide’, and finished with ‘In the name of the Father’. In sum, the students worked with five Explore Data assignments, and had started with the sixth when the spell was over. One of the assignments had no request for a statistical operation and is untypical. Therefore, there are in practice four full assignments to choose from.

Since Phase I of the study found a typical pattern in the structure of Explore Data assignments, the assignment that was closest to this could have been selected. However, it appeared to be other, more basic, aspects of the assignments influencing the students’ interaction. Thus, other arguments became more important in the selection.


As noted during the description of the theoretical perspective, prior experience can influence current interactions. The students, unlike the ones on the other sixth-form college, had no experience with the Explore Data assignments. This gives the opportunity to study interaction with S-vev that has not been shaped by experience. The chance is reinforced, as the assignment chosen for analysis is the first assignment in the first of Plan of Work. From the work with this assignment the students take on an approach found to be consistent with their approach in later assignments. The approach was operational, directing the activity towards efficiently generating and saving tables in their group document, not towards conceptual issues.

As explained earlier, a goal in interaction analysis is to examine how different resources are consequential in interaction. A reason for selecting this particular Explore Data assignment is the stable consequentiality of the digital learning resource in the students’ work. In difference from other assignments, the teacher did not interact with the students during the work with this assignment, so the students did the sense-making of the work themselves. The work with the assignment was also without technical problems, which took time and attention in two other assignments.

10.4 Interaction Analysis

The day before the Block Day, the student group had worked with the initial six pages of the Plan of Work ‘Cultures Collides’. The work with the Explore Data assignments was the first thing the students did in S-vev on the Block Day. The assignment selected for this analysis is the first in Figure 14, opening with ‘Enter the School Elections Inquiry from 2001...’

Figure 14: Explore Data assignments in ‘Cultures Collide’ (My translation)



EXPLORE DATA

Now you are going to use the School Elections Inquiries from both 1999, and 2001 in NSDstat for Web.

1. Enter the School Elections Inquiry from 2001, and find out if the pattern from 1999 has changed. Use the variables IMMIGRATION THREAT as dependent variable and GENDER as independent variable.

[Open the School Elections Inquiry 2001 in NSDstat for Web](#)
[Open the School Elections Inquiry 1999 in NSDstat for Web](#)
2. Is there any relation between the attitude towards immigration and which party one sympathises with? Find out how the situation was in both 1999, and in 2001. Are the results approximately the same? Make a cross tabulation between IMMIGRATION THREAT as dependent variable and ELECTED PARTY SHORT as independent variable.
3. Based on these results; can one say that some parties have voters who are positive to immigration, while others have voters who are sceptical of immigration?

Many factors can be involved in determining which attitude one has towards immigration and immigrants. Four such factors can be age, level of education, social and economic status, and part of the country. Choose one of these four factors and give grounds for how you think the chosen factor relates to attitudes towards immigration and immigrants.

Now you are going to use the inquiry *Attitudes towards immigration – extract of Omnibus 1999*. The four factors above are found in this dataset as the variables AGE, EDUCATION, SOCIAL AND ECONOMIC STATUS and PART OF COUNTRY.

1. Test the hypothesis you formulated above. Make three analyses; Use first SOCIAL SERVICES IMMIGRANTS, then EMPLOYMENT IMMIGRANTS, and finally CRIME IMMIGRANTS as dependent variable. For all three analyses you will use your chosen variable as independent variable. Based on these three analyses; can you say that you have found support for what you believed?

[Open "Attitudes towards immigration – extract of Omnibus 1999" in NSDstat for Web](#)

The analysis is built around a transcription of the students’ work. The transcript is continuous, but is broken up to make room for analytic comments. Subheadings are supplied to indicate main observations in the running analysis.

The following excerpt marks the beginning of the students’ work with the first assignment.

#	Name	Utterances	Actions
124.	Jon:	< > (1s) But-- shall open ninteen <ninty- >=yes, we must copy and paste what we did yesterday. (0,5s) ((Sweedish:)) Why not? (0,5s) < > ((Norwegian again:)) Take 99 first, maybe? < >	#04.34 <Scrolls down to Explore Data> <Clicks NSDstat for Web, the 2001 survey> <Clicks back button to Explore Data> <Clicks NSDstat for Web, the 1999 survey>
125.	Ole:	Yes::<mm::>	<Looks away, then to screen>
126.	Jon:	<((Humming ‘Smoke on the water’))>	<Flirts with Ole under the table to make him embarrassed>
127.	Ole:	<Yes- ((ler))>	<Looks at the camera, looks at Jon, looks at screen>
128.	Jon:	You are standing <with a grin straight towards camera>	<NSDstat has loaded, scrolls down to variable list>
129.	Ole:	Yes::	
130.	Jon:	<‘Add variable’.>	<Clicks button and quotes button label>
131.	Ole:	[Short turn, personal character]	
132.	Jon:	[Short turn, personal character] <(0,5s)>	<New web page with two variable lists has

loaded. Scrolls down to variable lists. Both lists have 'Sex' as default variable>

133. Ole: Mm::
134. Jon: Sure about that? (0,5s) <Now, which was it that was going to be dependent? Independent, that is 'Sex'. 'Immigrants politics', 'Immigrants threa- '>
135. Ole: Says-- <(.) there>, 'Immigrants politics'. <Points at the screen>
136. Jon: Not 'politics', 'threat', 'threat', > there. < > <Clicks variable 'Immigration threat'>
137. Ole: There.
138. Jon: 'Resu<Its'. ((Immigrant accent)) Look if we have done it correctly, here.> <Clicks the 'Result' button, web page with table loads>
139. Ole: Sure hope so. #05.26
140. Jon: <0,5s 'Quite agree', 'Boy', 'Girl'>, Yes, but that's correct=it is. Or- *heh*, it is probably correct. < Copy, then?> <Points with mouse pointer in the cell intersecting the first column category and row category. Quotes first row category> <Selects table, right clicks >
141. Ole: °Yes=m::°
142. Jon: <'Copy' (('Copy' originally uttered in English))> <Clicks copy, switches to Word>
 Make new, make new page, <then. [(0,1s) > < > <Moves hand from mouse to keyboard>
 > <Hits enter key twice, freezes body and hand>

The work with the first assignment starts 1 second after the Explore Data assignments appeared on the screen, by Jon¹⁵ stating '*But-- shall open nineteen*' (turn 124) and clicking the the link below the assignment text, called 'Open the School Elections Inquiry 2001 in NSDstat for Web'. As the page loads he states that they have to print what they did yesterday, referring to the group document containing answers to mini assignments in the reading matter. He notes the lack of response from Ole, and decides to enter the oldest survey first. When he says '*Take 99 first, maybe?*' he has already clicked the back button from the 2001 survey. His utterance thus function more as an explanation than a proposal.

The 1999 survey takes a few seconds to load, and this is filled with off-task talk. As the page has loaded Jon clicks the 'Add variable' button (turn 130) and quotes the button label. His explication of his action serves to make a common attentional focus on the interaction on the screen. By clicking the button a new version of the web page will load with a second variable list, so that they can make a cross-tabulation between two variables. The off-task talk continues until the web page has loaded.

¹⁵ The names of the students are pseudonyms.

The default selected variable in the variable lists is 'Sex'. Jon then clicks the first variable list (turn 134), so that a few variables are visible, the rest of the variables can be reached by scrolling down. He says to Ole: *'Now, which was it that was going to be dependent? Independent, that is "Sex".'* He continues by reading variable names out loud. Ole points at a variable and says 'Immigration politics' (turn 135). Jon makes clear that he knows that they are looking for the variable 'Immigration threat' (turn 136). Since Jon knows which variable they should choose, it is clear that he read it in the assignment before they entered NSDstat for Web. The assignment had only been visible on their screen for five seconds before they entered the 1999 Inquiry, and they talked during those seconds. This indicates a selective and goal directed reading of the assignment text to pick up and remember the variables. A selective reading of the assignment is eased by that the variable names are in capital letters.

'There', the two students say all at once to indicate that they spot the 'Immigration threat' variable in the list, and Jon selects it. Jon did ask Ole which should be the dependent variable, but was the first one to say its name. He may therefore have asked not primarily for the *name* of the variable, but for its *position* in the list. The focus was thus on the immediate visible screen, and the operations on the computer. Moreover, the interaction functioned to make the operations efficient, as both students were looking for the variable.

In the next turn (turn 138), Jon clicks the 'Result' button as he quotes the button label. This follows the same pattern as with the quotation of the 'Add variable' label. The web page with the table resulting from the tabulation starts to load as Jon continues with *'Look if we have done it correctly, here'*. When the table has loaded Jon evaluates it by pointing with the mouse pointer in the area with category names (turn 140) as he quotes the first category 'Quite agree' of the 'Immigrant threat' variable, and both the categories 'Boy' and 'Girl' from the 'Sex' variable. He concludes the evaluation with the utterance: *'Yes, but that's correct=it is. Or- *heh*, it is probably correct.'*

Next, he starts to select the table by clicking and dragging with the mouse pointer, and asks: 'Copy, then?' Once again, the action precedes his question, and the question functions more as an explanation or explication of the operation. The operations, rather than the talk, are driving the interaction forward. Ole gives positive feedback on the action/question (turn 141). Jon right clicks the selection (turn 142), and chooses 'Copy' from the context menu and explicates his operation by quoting 'Copy', but in English rather than Norwegian. He then switches to Word, where the table is pasted.

The operations are in the centre. The talk serves to explicate and support the operations. At the time where no operations were possible, because the web page was loading, the talk was off-task. The interactional resources are also asymmetrically distributed, as Jon controls the mouse. The pattern of the interaction is that Jon initiates operations on the computer, and follows up with

explanations and explications of what he does. Ole's turn are mainly feedback on Jon's explications and questions.

On who is in control of the operations

In the turns following the previous excerpt, the pattern of Jon operating the computer changes as Ole takes a turn¹⁶.

- | | | |
|-----------|--|--|
| 142. Jon: | <'Copy' (('Copy' originally uttered in English))> Making new, making new page, <then. [(0,1s) > <> | <Clicks copy, switches to Word>
<Moves hand from mouse to keyboard>
<Hits enter key twice, freezes body and hand> |
| 143. Ole: | (0,4s)] | [Lucky Luke-like hammering of hotkeys while body and gaze relaxed. Two new pages appear, table about to load, eyes frozen on screen] |
| 144. Jon: | (1s) <(1s) Hm::> Mmm:: ((Humming 'Smoke on the water')) < > | <Turns to Ole, turns to screen, relaxes hand and nods affirmatively>
<Table appears> |

In turn 142 Jon says '*Making new, making new page, then*'. This may be a proposal, as it precedes the action of making a new page, but the tense of the verb, indicates that it is something that is already in progress. His subsequent hand movement to the keyboard shows that he intends to make it happen. Just before he starts to hit the enter key, Ole precedes the operation by swiftly hammering a series of hotkeys (turn 143) on the keyboard to make a new page and paste the table. The hammering is so fast that he presses one of the hotkeys too many times, so two new pages appear instead of one. By 'stealing' a turn at operation, Ole makes a noteworthy change in the interactional pattern. This is visible in how Jon stops the flow of interaction by freezing for a second, then turning to Ole (turn 144), then to the screen, before relaxing and nodding affirmatively. Ole, on the other hand seems to counter that there is anything special about him taking an operational turn. This is indicated by his relaxed body and gaze. He focuses on the screen rather than meeting Jon's gaze or openly noticing his spectacle.

The asymmetry that only one controls the mouse, boosts the focus on operations, as Ole starts doing what is required on keyboard. The way Ole 'stole' a turn at operation, buttress the view of operations as important in the activity. It demonstrates to Jon that they are two about the operations, and that what happens on the screen is owned by both of them. Ole shows Jon that Jon does not have ownership of the keyboard, and Ole may take turns at the keyboard at a later time.

¹⁶ The excerpts in the interaction analysis are continuous. All verbal utterances in the work with assignment number 1 is presented, unless otherwise stated in the text.

Making the group document intelligible, and generating second table

The interaction in the previous excerpt continued with five turns about moving the table up one page in the group document, since there had come two new pages instead of one. The interaction continued as shown in the following excerpt, with taking the first turn at the keyboard, after Ole's use of hotkeys.

145. Jon: Writing 1999, <then. > <Moves hand and punches 1999, appearing in corner of table>
146. Ole: Yes
147. Jon: < ><((Humming 'Smoke on the water'))> <Here?> <Presses the back button three times, so the assignments reappear. Clicks link for NSDstat, 2001 survey.>
<Web page loads. Scrolls down to variable list. Default variable is 'County'.>
<Places mouse over 'Add variable' button>
148. Ole: But give a dam-
149. Jon: < > (.) Aren't we we going to have the same? < > <Clicks 'Add variable' button> <New web page with two variable lists has loaded. Scrolls down to variable lists.>
150. Ole: Jo, må være det.
151. Jon: <Ye::ah.> <Scrolls list of variables, chooses 'Immigrants threat'>
152. Ole: Joda, bare velg det. Nei.> E det det? 'Innvandringstrussel', jo.
153. Jon: <Sex, sex, sex > <Scrolls second list of variables
154. Ole: Downwards
155. Jon: SE::X.> <There, 'boy or girl',> >
<'Result'> <Yes, mm::, no.> <Selects 'Sex: Are you a boy or a girl?' from list of variables>
<Clicks 'Result', copies table and pastes into Word document>
<Changes position of table in document>

The excerpt starts with Jon explicating his actions by saying 'Writing 1999, then' (turn 145), as he punches '1999' on the keyboard. He has already placed the cursor in the upper left corner of table, so the '1999' becomes a legend for the table indicating that it is from the 1999 survey. Ole gives positive feedback. The labelling is a way of making the group document intelligible, and indicates that the document will be consulted later, for example by themselves or by the teacher.

Next, Jon presses the back button until the assignments reappear and clicks link to open the 2001 survey in NSDstat for Web (turn 147). While the web page loads he hums some 'pause music'. Next, he places the mouse pointer over the 'Add variable' button and asks 'Here?' Ole's swift response 'But give a dam-' (turn 148) is probably said to halt the operations. It constitutes what Jordan and Henderson (1995) calls 'trouble', meaning that the normal stream of activity is broken.

Jon clicks the button, and with ‘*Aren’t we we going to have the same?*’ (turn 149) he interprets the trouble to be about the variables. A difference visible to both students, is that the variable list displays the default variable ‘County’, instead of ‘Sex’, like in the 1999 survey. Although the variables are the same in the two surveys, the order is different.

Through the next turns the trouble is repaired as Jon scrolls the variable lists, and they recognise the same variable names as they used for the preceding tabulation. For example, Jon’s repetitive utterance ‘*Sex, sex, sex*’ (turn 153) serves to explicate and focus a common attention on the screen and on the searching. Ole may have spotted the variable as he directs Jon’s attention by saying ‘Downwards’ (turn 154), and Jon says ‘SEX’ (turn 155) with a loud voice, telling that he has spotted the variable. He continues to read aloud from the ‘sub-title’ of the variable, ‘boy or girl’, as he selects it. He clicks the ‘Result’ button, and like before, he quotes the button label. The combination of Jon’s utterances ‘*Sex, sex, sex*’ and ‘SEX’ was pronounced with a rising voice. The utterances can also function as explication of an expected progression. (A note on language differences: The students use a Norwegian word that can only denote the biological sex.)

Like the preceding table, this table is also copied and pasted into the group document, but this time without verbal explications and concents. This may indicate that the activity has reached a point of routine.

Deciding that they are finished with the assignment

Ole’s next turn, the first turn of the excerpt below, causes the conversation to turn to the off-task subject they had started in the beginning of the work with the assignment.

- | | | | |
|------|------|--|--|
| 156. | Ole: | ((Whisperers inaudible)) | |
| 157. | Jon: | Fuck did we join up with this thing, huh? <> | <Places cursor in upper left corner of table> |
| 158. | Ole: | <> | <Punches ‘2001’ > |
| 159. | Jon: | ((Makes regurgiating sound)) | |
| 160. | Ole: | Or was it two-thousand-and - Was it 2001? | |
| 161. | Jon: | <E::h> 2001. Look here, right. | <Switches to NSDstat> |
| 162. | Ole: | Sure | |
| 163. | Jon: | <((<u>Sound effect: Shhh</u>))> 2001. ((‘Clicks with tongue’)) < | <Highlights ‘School Elections Inquiry 2001’>
<Clicks Back button in browser three times |
| 164. | Ole: | Cool. | |
| 165. | Jon: | ><> I think we’ll get a tidy profit for the filming. | <Explore Data assignments becomes visible> |
| 166. | Ole: | Yes, 10000 each. | |
| 167. | Jon: | Yes. At least. <> | <Scrolls down so that Explore Data |

assignments are no longer visible. Scrolls
swiftly up, then down again>

168. Ole: ((Whispering))

169. Jon: < >

<Holder foran mic-en>

170. Ole: ((laughs))

171. Jon: Hey, you, Inga, are we just going to start with that
'Age' project. Because now we have written a lot of
stuff, ((mumbling:)) so--

In turn 156 Ole whispers something inaudible to the microphone that makes Jon comment on their situation as participants in a research study: *'Fuck did we join up with this thing, huh?'* (turn 157). For the first time since the start of the work with the assignment the students' talk is not related to the operations. That the attention shifts to the filming situation can according to Jordan and Henderson (1995) be taken as evidence that the high point of an event is over, and participants once more can orient to the periphery.

Jon continues to operate the computer by placing the cursor in the upper left corner of table (turn 157). Ole is still attentive to the operations, as he takes a turn at the keyboard by punching '2001' (turn 158). Writing a legend for the table was something Jon had previously done for the 1999 table (turn 145). Ole therefore knew what was going to happen, and could precede Jon's action by 'stealing' the turn at the keyboard. Like before, Jon comments on how this marks an unusual change in the interactional pattern by making a 'regurgiating' sound (turn 159). However, Ole maintains a frame (Goffman, 1974) of the situation as concerning operations by taking Jon's sound for a sign that he had punched the wrong year (turn 160). Jon decides to continue within Ole's frame, and uses the legend on top of the web page to confirm that the year is 2001 (turn 161). They signify that the trouble is solved by Jon's click of the tongue (turn 163), and Ole's expression 'Cool' (turn 164). The talk changes back to commenting on their situation as research participants, and Jon carries on with operating the computer.

Jon has clicked the 'Back' button in browser and the Explore Data assignments becomes visible (turn 165). The assignments are visible for five seconds, while Jon and Ole looks at each other and exchanges three more turns on the off-task subject. Three of the seconds, Jon's eyes are at the screen. After the exchange Jon scrolls down so that the Explore Data assignments are no longer visible (turn 167). The screen now displays two sections that do not contain assignments, namely Keywords and Related Web Pages. After a second, Jon scrolls quickly up half the Plan of Work, and down to the bottom again (still turn 167). The operations stop, and they shift attention to off-task talk. The scrolling down, and the focus shift indicates that they judge that they are finished with what they are going to do in the Explore Data section. Jon then asks the teacher if they should move on with the 'Age project' (turn 171).

However, the students had been told to finish the other assignments before starting with the 'age project'. It is therefore interesting to look at a characteristic in the interaction right before they judge that they are finished with the Explore Data section. Before Jon decides to scroll below the Explore Data section, the assignments are visible for five seconds. The way they initiated the work with the first assignment was by clicking the links right below the assignment wording. The links can be seen in Figure 14. The subsequent assignments do not have links. The last assignment had a link, but this assignment was just 'below' what was visible on their screen, and after Jon had scrolled, the link was just 'above' what was visible. Thus, when the students decided that they were finished, they had not seen any more links for generating tables.

Generating tables had their focus during the work with the assignment number 1. The tables themselves proved important in the last sentence in Jon's prompt to the teacher: '*Because now we have written a lot of stuff, ((mumbling:)) so--*' (turn 171). The way Jon signifies to the teacher that they are finished, is by reference to 'written material'. Physically, they have only written eight digits, by typing '1999' and '2001', so it is reasonable to claim that Jon primarily refers to the two tables they have pasted. The rationality behind judging that they are finished may be that the subsequent assignments visible to the students had no links that signified that tables could be made.

10.5 Analysis of Interview

The interaction analysis showed that the students focused on the parts of the work that required operations on the computer. The operational focus is reflected in what the students report in the interview. The following excerpt is from the opening part of the interview:

172. Arngeir: What kind of goal did you have when you were working?
173. Jon: It was, I guess, really to cope with those assignments in the best possible way.
174. Ole: To get done with it as much as possible, do them, like- run through most of it.
175. Jon: But, in keeping with that we get the answers so to speak lined up, then it is a bit easier to somewhat... the goal is, sure, in a way to cope with it, to the greatest possible extent, correctly, then.
176. Arngeir: But, uh, where... where is it you 'get the answer', so to speak?
177. Jon: Where you get it from?
178. Arngeir: Yes.
179. Jon: From that, there, the internet page.
180. Arngeir: Yes.
181. Jon: Or, like-
182. Ole: -the end of the assignment.

183. Jon: Or, you have to click on, to- you have to follow some links, and then you get- make such variables and tables and a bit such things. Then statistics appear, which they probably have conducted, and a year, and a bit such different things.

Although the first question in the excerpt, and the previous questions do not concern any particular part of S-vev, the students single out 'those assignments' (turn 173) when summarising the goal of their work. When they later explain how answers are produced (turn 183), it is clear that it is the Explore Data type of assignments they are referring to. This supports the claim in chapters 5 and 1 of the dominant role of Explore Data assignments in S-vev.

In the excerpt, the students say the goal of the work was to get done with the assignments and solve them correctly. By measuring answers as correct or incorrect (turn 175), the students point to the concrete outcome of their work rather than their own understanding from working with the assignments. Answers to the assignments are 'so to speak lined up' (turn 175). The main impression from the excerpt is that the students focus on progress, by saying that they should 'run through' and 'get done with it' (turn 174).

The talk of 'lined up' answers corresponds with the fact that most questions prompt the students to use a tool that generates a concrete outcome. The wording of the Explore Data assignments often inquires reflection, but this is not accentuated in the interview, and a sense of routine is induced when they talk about assignments that are run through, and answers that are lined up.

A concern for physical operations

The two students shared one computer during the work with S-vev. The following excerpt is about collaboration and group work, but it additionally reveals a certain focus in the work. The backdrop for this excerpt was an interviewer question on how the group would have communicated their work if they were to include a third, uninformed, student.

184. Jon: I dunno, on the PC, onto, like S-vev, then-- was really just a one-man job, though.
185. Argeir: Okay.
186. Ole: Three people sitting in front of a PC, then there won't be that much done.
187. Jon: Several coming with different--
188. Argeir: What did you say, that--
189. Ole: If there are three people sitting in front of a PC, then it's one who is working or we-
190. Argeir: Yes.
191. Ole: Then the others will make objections, and such.
192. Argeir: Yes.
193. Ole: Somehow.
194. Jon: Then there, somehow, is one writing, doing something, and then there is the other two -will surely be sitting bringing ideas and contributing and--

195. Ole: Yes.
196. Jon: Comments, and so on.
197. Argeir: Okay, yes.
198. Jon: It's not easy to get three people around the same keyboard.
199. Ole: That's a bit tricky.

The excerpt opens with the statement 'I dunno, on the PC, onto, like S-vev, then-- was really just a one-man job, though' (turn 61). This is followed up pointing at limitations in the user interface. If the important outcome of the activity is written or pasted material, then it makes sense that the students say it is difficult to do anything with just one keyboard; 'there won't be that much done' (turn 186).

Because, the way it is now, one student is 'working' (turn 189), and the other is 'contributing' (turn 194). The 'work' is attributed to operational aspects of the activity. The progress is yielded by the person operating the keyboard. The 'one who is working' (turn 189) is only interrupted by the other's 'objections' (turn 191). Ole's wording is moderated by Jon from 'making objections' to 'sitting bringing ideas and contributing' (turn 194). Even moderated, the wording still signifies a supplement in the activity, and does not point to a *genuine interdependence* (Salomon, 1992).

The interview cannot be used as an alternative description of what happened during the students' work, but it can serve as a pointer for the students' perspective of what they were doing. When the students frame their work in the interview, they focus on the part carried out by operating the computer. This focus is similar to that identified in the interaction analysis.

10.6 Discussion

The following will discuss findings in the analysis for the technical college. The analysis is the second out of two analyses in Phase II. The research question in Phase II has been:

What characterises the students' interaction during the work with the Explore Data assignments, and which resources are used in the interaction?

As seen in the summary of the work with the Explore Data assignments (section 10.2), and argued for in the selection of case for interaction analysis (section 10.3), the students had a general operational approach to their work. The interaction analysis showed how this looked in the small.

Jordan and Henderson (1995) note that beginnings and endings of events tend to give much information of how interaction is organised. When the students started the work with the assignment in question, they immediately began to work on the virtual/physical tasks outlined in the assignment. This is illustrative of their subsequent interaction, which can be characterised as what Jordan and Henderson (1995) calls 'instrumental interaction', as distinct from 'talk-driven

interaction'. In the interaction the students shared a common task orientation and attentional focus related to their operations.

Turns at talk (ibid.) were for the most part initiated by Jon. His turns seemed to start by actions. First, he started some new chain of operations on the computer, and then he explicated in talk what he was doing. Ole's turns were mainly feedback on Jon's explications and questions. This outlines a certain participation structure (ibid.) in the interaction.

The participation structure cannot simply be attributed to traits of Jon and Ole. The interactional resources (ibid.) were asymmetrically distributed, as Jon was seated by the mouse. Ole showed unease with this situation, as he a couple of times stole turns at the keyboard when Jon's hands were not there. The spatial organisation (ibid.) thus influenced the activity.

Since Jon advanced the interaction instrumentally by operations, boundaries between new segments of activity (ibid.) were rarely negotiated. Rather, they were noted in Jon's explication of operations. As the students learnt the required operations, there was less explication, and more social talk. Jon's explication of his actions served to make a common attentional focus on the interaction on the screen. The students looked mostly at the screen, and relatively little on each other. Since the chairs were not swivel chairs, their bodily orientation was in a sense fixed towards the computer.

Several artefacts (ibid.) were important in the interaction. The virtual artefacts on the screen became important points of reference and attention. A virtual artefact of much attention was their group document. This was later printed. The physical document was then used as the centre of attention in interaction with the teacher. Other physical artefacts, the mouse and the keyboard gained attention by both parties. The Teacher's Plan was consulted, and the work with the assignments was considered as one out of several points in the Teacher's Plan. The assignments themselves were important resources in the interaction with the computer. However, they were not important resources in the interaction between the students.

The students focused on the part of the assignments that could help them generate a visible result of their work. Thus, one may claim that the students displayed a '*culturally competent course of reading*' (McHoul, 1982 in Watson, 1997, p. 88). Scardamelia, Bereiter and Lamon (1994) have noted that a concern for creation of products is often a part of school culture. The students were anxious to document their work, and towards the end of the spell with the Explore Data assignments they contacted the teacher to show her the visible outcome of their work. The interviews indicate that a focus on product is part of their general approach. Here they focus on the visible outcome of their work, rather than on understanding or on conceptual issues.

The interaction analysis showed how the students' operational approach worked in the concrete, and suggested a rationality of efficiency and of correct answers. These are common findings in a school setting. Studies described earlier also have similar findings.

The description of the students' overall work shows how the teacher once prompted students to reflect on the pattern of a table. The students did, but when the teacher left, they made no further efforts. Teachers are likely to influence how students interpret assignments. The students at the technical college had not used S-vev earlier, and consequently the teacher had not been much involved in their S-vev work. Much the same, some of the teachers in Westrum Hvammen's study had a passive role during students' work. S-vev alone only to a limited extent managed to demonstrate the purpose of the Explore Data assignments to the students. Like with the current case, Westrum Hvammen (2003) found that instead of trying the role of social science researchers, the students replicated content by generating statistical tables, and using copy and paste to transfer them to working documents in a word processor. The content of the tables were not discussed. Often the students generated statistics without any understanding.

Lindwall and Bernhard (forthcoming) in their interaction analytic study on students working with microcomputer-based laboratories found that some students had a rationality of making their lab-report look good or a quick and easy completion of the task. This had implications for the kind of learning students were engaged in. The students' procedures were such that they avoided conceptual issues related to the science phenomena in question. The rationality and lack of conceptual focus was thus much like in the current case.

In approaching the assignment in the interaction analysis the students at the technical college ignored the first part of the assignment, and moved straight to the instructions. In a report on ICT in citizenship Selwyn (2002) puts forward Graber's (1988) observation that people tend to be 'cognitive misers' – opting for the approach to new information which they believe will involve the least mental effort on their part. Selwyn notes that this point has later been reinforced in educational research.

Scardamelia and Bereiter (1996) comment that one of the most crucial problems related to the process of collaboration is the difficulty in making inquiry questions that would evoke elaborated explanations. The opening of the Explore Data assignment did not seem to encourage later explanations on the part of the two students. Rather, the opening was formulated as a factseeking prompt. In this regard Järvelä et al. (2004) note that 'unlike factseeking questions and unambiguous tasks, open-ended and discovery tasks (Cohen, 1994) can promote joint problem solving and reasoning. Tasks that are too obvious and unambiguous do not leave space for questions, negotiations, explanations and arguments' (Järvelä et al., 2004, p. 116). The researchers go on stating that one of the biggest challenges in instructional design and support of CSCL is to provide real group tasks and contexts that stimulate questioning, explaining and other forms of knowledge articulation and demanding collaborative activities.

The previous has discussed findings in Phase II related to the sixth-form college. The next chapter will relate Phase I and II of the study, and thus take a broader perspective.

11. DISCUSSIONS AND CONCLUSIONS

The point of departure for this study was the call from National Board of Education for digital learning resources in citizenship, aiming to bring advancement in ‘creative pedagogical solutions’. NSD produced S-vev in response, built on a pedagogical idea to adopt the concept of laboratory into social science. The producer purported a perspective on which kind of activity S-vev would support and on how resources were provided accordingly. However, it was not given that students identified the same resources in the assignments as the producer did. Nor that they were used as the producer had envisioned. An overarching interest was thus issues arising when the producer perspective met praxis.

To be able to relate the producer perspective to praxis, the settings of the producer and the students were first studied in their own right. This was done in two phases of study, each with a separate research question. The findings of Phase I were discussed in section 7.3 and related to the research question. For Phase II this was done in the sections 9.6 and 10.6. The following will give a brief recapitalisation of the sections, before relating the findings of the two phases.

The first phase had the research question: What is the pedagogical design of the Explore Data assignments; which activity does the producer envision this design to support, and what do the provided resources look like?

NSD calls its pedagogical platform the laboratory of social science. It is explained by constructivist rhetoric where the student is seen as having a natural inclination towards research. The NSD goal for S-vev is to enable students to participate in a process where knowledge is created through the gathering and analysis of relevant information. NSD points at the opportunity for students to engage in an ‘*exploratory process*’ where they tabulate variables of their choice to shed light on a problem area. The goal of the process is that they start reflecting on underlying causes of how the variables are related, and the implications of their findings. NSD states that S-vev will enable students to try the role as social science researchers. The Explore Data assignments were designed for this purpose.

The content analysis of the Explore Data assignments identified resources for reflection, as well as resources for operation. The resources formed a pattern in the design of the assignments. Many assignments were built on a model widely used in science education, namely predict–observe–explain. First, users must predict the outcome of a cross-tabulation and must justify their prediction; then they describe what they see in the resulting table; and finally they must reconcile any conflict between prediction and observation. At first glance this model appeared as the central circuit in a social science exploratory process. However, the assignments ‘short-circuit’ the process in that users’ are not encouraged to pursue their explanations by making new statistical

analyses. Rather, the variables for statistical analysis are pre-selected in the assignments. A main finding from Phase I is therefore that reflection and statistical work is disengaged, since reflection is not permitted to influence how NSDstat for Web is used.

The document analysis related the design of the Explore Data assignments to NSD's visions. Here it was suggested that NSD attempts to model an activity of social scientists by supplying the Explore Data assignments with resources for scaffolding. However, this seems to be done from an underlying goal connected to the schooling practice, namely to convey content. The statistical data are most important in the pedagogical design, making the assignments 'data driven', so to speak. The scientific process portrayed in the assignments comes out short.

The second phase had the research question: What characterises the students' interaction during the work with the Explore Data assignments, and which resources are used in the interaction?

A characteristic of student's interaction found in both groups was that the assignment had an apparent role in the interaction. The students' interaction displayed a concern for *solving* the assignments, and thus looked for 'assignments in the assignments'. The two student groups identified different parts of the assignments as resources.

For the students at the technical college the assignments themselves were important resources in the interaction with the computer. However, they were less used as resources in the interaction between the students. The students displayed a rationality of having something 'to show' to the teacher. They had a strong tasks focus, and a concern for completing the assignments quickly. They had an understanding that the purpose of the work was to provide specific, observable 'answers' to the assignments. This influenced how they read the assignments. The assignments were used as point of departure for generating tables that could be pasted into the group document.

The students on the sixth-form college identified more resources in the assignments than the other student group did. The assignments were much referred to in the interaction between the students. The students had a rationality of having something 'to show', in case the teacher collected their personal documents. However, they also had a rationality of having something 'to say', as well, in case they were picked out by the teacher to present their material. Such presentation would require more understanding. The students had a strong task focus, moving forward without much negotiation. This indicated a common background resource in their work. In the interview the students talked of typical activities in working with the assignments. Based on how the personal documents should look, they said that first they were to have a hypothesis, then paste the table and lastly, write a comment. The common background resource does not only come from prior work experience, but also from what the teacher has told the students.

The following compares the resources from the producer's pedagogical design to the resources identified by the students.

11.1 Producer Perspective Meets Praxis, the Sixth-Form College

The interaction analysis of the six-form college analysed the students' work with the assignment below.

In which one of the following countries do you believe the confidence in the UN is the highest, in the USA, Mexico, Australia, Norway, Nigeria, India or Russia. Give grounds for why you believe the confidence is particularly high in this country. That is called making a hypothesis or an assumption about a relation. Check the hypothesis by making a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable.

In the content analysis the current assignment was coded the following way. First there is an 'expect' instance asking students to hypothesise by making a prediction and giving grounds for the prediction. Next is a 'verify' instance, asking the students to check their hypothesis. This is immediately followed by a 'generate' instance with instructions for generating a table in NSDstat for Web. Phase I suggested that instances of the 'expect' and 'verify' categories were provided by NSD as resources for reflection, whereas the 'generate' category was provided as a resource for operation. The structure of the assignment fits with the predict–observe–explain pedagogy identified in Phase I.

A general point in the first phase was that the assignments pre-specify the variables for analysis in NSDstat. This determines which physical operations are required in solving the assignment, and makes a certain statistical result the only possible outcome. To illustrate, the above assignment could have worked if presented in a book. Picture the last sentence of the assignment replaced with the following text.

Now turn the page, and see a cross-tabulation with CONFIDENCE IN THE UN as dependent variable and COUNTRY as independent variable: Use the table to check the hypothesis.

Noticeably, the resources for reflection in the assignment are unaffected whether the table is produced by turning pages or by using NSDstat for Web. The loose connection between reflection and operation was remarked already in Phase I: The student is not dependent on the resources for reflection to be able to follow instructions given by the resource for operation.

The students' work will now be related to the resources suggested in Phase I, the producer perspective. In the students' work with the assignment, they used the two first sentences from the assignment text as resources for verbally defining two 'assignments in the assignment'. That is, the *prediction* and the *prediction's grounding* were not seen as one process of hypothesising. By identifying the first sentence in the assignment as a separate subtask, the students were able to use

this sentence to avoid a discussion on *general* reasons for having confidence in the UN. Only after having settled on which country they believed had the greatest confidence in the UN, they used the second sentence as a resource for grounding their decision. Thus, they first agreed on a prediction by a more or less educated guess, before secondly giving a *specific* reason for this prediction. Both the prediction and the grounding were included in what the students labelled 'hypothesis' in their personal documents.

After the students had generated the table, the students seem to have recognised the 'verify' instance that depicted the table as an aim to check the hypothesis. The students made a comment in their personal documents arguing for the correctness of their prediction. However, their prediction's grounding was not reviewed. The students did not draw any implications of the results in the table. The work was not part of a wider exploratory process; the students continued with the next assignment, which had pre-specified variables. Since the horizon of the work were single assignments, there was no need to review the grounds for predicting.

The pedagogical design of the Explore Data assignments makes students' reflection into something *annotating* their work in NSDstat for Web. Reflection and statistical work is disengaged, since reflection has no consequence for how NSDstat for Web is used.

The students needed no verbal discussion of the instructions for generating the table. The task was nevertheless treated as a subtask, leading to a pasted table in their personal documents. The phrase asking the students to check their hypothesis was not verbally discussed either. Yet, the students made a comment in their personal documents. Even if the particular assignment did not call for it, the subtasks identified by the students all resulted in some form of content in their individual digital documents. *Text* answered the resources for reflection. A *table* answered the resource for operation. The interaction analysis and the interview showed that the product was important. A rationality behind the identification and documentation of subtasks was having something 'to say' in case they were picked out by the teacher to present their material to the class, or the teacher collected their individual documents.

It is now time to characterise the students' work in terms of learning, to be able to see what kind of pedagogy is active in the students' work. First, the content of the table seems well conveyed to the students. They had an advanced discussion, exploring patterns in the table. Still, they did not discuss *why* the patterns were as they were. Neither did they draw any implications from the patterns. What they did was simply to relate the patterns to their prediction. Based on this, it would be too strong to say that the students were engaged in an exploratory process of social science.

By confusing predictions and hypotheses, the Explore Data could give students the impression that hypotheses about society can be *verified* by a simple tabulation, rather than *supported*. Held up

against the goal of S-vev of letting students try social science, this is a serious misrepresentation. Fortunately, there was no evidence that students (or teachers) treated hypotheses as ‘proved’.

NSD’s thought is that students should learn thinking skills and try the role as social scientists. NSD succeeded in having the students use a method; it was important for the students to settle on a hypothesis, to generate a table, and to comment on the result. The way each student identified subtasks in the assignments, sometimes without prior coordination, showed how their work relied on prior experience. Unlike the group on the technical college, the sixth-form students had almost a year of experience with S-vev in citizenship. In the interview the students displayed a predict–observe–explain understanding of the assignments, the same understanding that was identified in Phase I. Thus, one may say that students have learnt social science thinking skills. However, the skills are exercised in an activity different from social science. They were applied as skills in solving assignments. The rationality of the students’ work was not in pursuing an inquiry-based process.

To recapitalise, the students did not review the grounding of their hypothesis after having generated the table, even if they had a strong task focus. The group’s work illustrates that the Explore Data assignment *allow* students to complete the work without reviewing their prediction’s grounding, and without relating the content of the table to a wider inquiry. In terms of learning, content is well conveyed, but implications of the content are not pursued.

11.2 Producer Perspective Meets Praxis, the Technical College

Here, findings of Phase I will be related to findings in the analysis for the technical college in Phase II. The interaction analysis of the technical college studied the students’ work with the assignment below.

Now you are going to use the School Elections Inquiries from both 1999, and 2001 in NSDstat for Web.

3. Enter the School Elections Inquiry from 2001, and find out if the pattern from 1999 has changed. Use the variables *IMMIGRATION THREAT* as dependent variable and *SEX* as independent variable.

Open the School Elections Inquiry 2001 in NSDstat for web

Open the School Elections Inquiry 1999 in NSDstat for web

In the content analysis the assignment was coded the following way. First, there is a ‘find out’ instance instructing the students to find out if the pattern has changed from 1999 to 2001. Then a ‘generate’ instance gives instructions for which tables to make. Phase I suggested that instances of the ‘generate’ category was provided by NSD as a resource for operation. Instances of the ‘find

out' category simply state something one should find out by making and reading tables. It was suggested that NSD had provided them as general contextualising resources. A characteristic of 'find out' instances is that most of them appear in untypical assignments, as for example the current assignment, which asks for two tables instead of one. In uncommon assignments students are less familiar with the requested statistical operations, and this may explain the directive nature of the 'find out' instances.

The students on the technical college shared one computer. Jon, who was seated at the same side of the keyboard as the mouse, controlled most of the operations required by the assignment. The students on the technical college finished their assignment more quickly than the students on the sixth-form college did. Unlike the other student group, the students did not read aloud from the assignment. Jon used the links below the assignment, moving straight to NSDstat for Web. It was apparent, though, that he had read the resource for operation, as he knew which variables to use. The interaction analysis displayed a strong focus on generating tables. The students did not show any sign of identifying the 'find out' instance as a resource, and they did not discuss the content of the tables. Assignments lacking links for generating tables were not even read, until the teacher told them to go back and do so. Thus, the students had an operational approach, focusing solely on the physical/virtual tasks required to solve the assignments.

When characterising the students' work in terms of learning, it is apparent that the resource for operations works. The students easily control NSDstat for Web, and gain routine at generating the tables specified in the assignment. However, the students do not discuss the content of the tables, and consequently draw no implications based on the tables. The activity is quite different than the producers had envisioned; the students' do not engage in a process where knowledge is created from the gathering and analysis of relevant information.

After the students' work with the Explore Data assignments there was a class discussion. In this discussion, the teacher asked the students about their beliefs on the themes in the assignments. The content of the tables were discussed, and she asked the students whether the results in the tables were in accord with their original beliefs. Thus, the classroom discussion afterwards does much the same as the resources for reflection were supposed to do. This points up that, in the students' work with the assignments, the resources for operation are disconnected to the resources for reflection; the reflection could be successfully postponed to the discussion afterwards.

To recapitalise, the students in the technical college had no prior experience with S-vev. Yet, they displayed a strong deliberation to generate the tables asked for in the particular assignment. However, they took no notice of the prompt in the assignment to reflect on their work with NSDstat for Web. This illustrates that the Explore Data assignments allow the students to complete the physical work with NSDstat for Web without reflection, and still come up with something they judged to be a legitimate outcome.

11.3 Discussion

The following discussion will connect findings in the current study to findings in related studies. In the current study, the producer wants to incorporate the laboratory in social subjects. NSD intends to enable students to ‘participate in a process where knowledge is built through the gathering and analysis of relevant information’ (NSD, 2001a, my translation). The purpose or the rationality displayed in the students’ work, however, is solving assignments. The procedures to be undertaken in the assignments are related to this purpose. The students were not seen to employ the processes in a wider inquiry.

A focus on completing assignments is also a finding in prior research on laboratory work in science education. Amerine and Bilmes (1988), who performed an ethnomethodological study of a Grade 3 classroom, claim that students did learn by participating in a cookbook science lab, but that they learnt something quite different from what was intended. Instead of giving the students opportunities to engage in a scientific process, the lab trained and tested the students’ competence in following instructions. This finding is also reported by Roth (1999), as he summarises several years of observation of cookbook labs in science education. Roth observes that in their attempt to follow recipes, students are gathering and recording data without a clear sense of the purposes, the procedures or the interconnections between the two.

This point leads to another problem identified in the current study. One of the interaction analyses shows that it is possible to understand an Explore Data assignment like Ole and Jon. Since the physical/virtual operations required to solve the assignment was specified, they could get a visible result from the assignment without any reflection. Thus, there was no need to make wider inferences of the purpose of the assignments, other than generating tables. Roth (1999) remarks a similar problem in cookbook labs, that investigations provide low cognitive demands that preclude reflective action.

The other interaction analysis shows that it is possible to understand an Explore Data assignment like Ivar, Paal and Ulf. The resources for reflection were very contextualising of the students’ reflection. They used the resources as a recipe to focus and restrict their discussion, and did not move beyond the reflection asked for in the assignment. That is, they did not discuss the grounding of their prediction after the table was generated. Consequently, no implications were drawn of their findings.

The latter interaction analysis illustrated what was pointed out in Phase I, that the resources in the assignments were most contextualising. It was very clear which tables were relevant and what was ‘relevant information’ in the tables. The process that had made certain information relevant was not accounted for. Tables are portrayed as facts in that students are asked to test hypotheses by a simple tabulation. The scientific process skills in the assignments are thus portrayed as rational ‘short-cuts’ to these facts. For labs in science education Roth (1999) points out that laboratory

activities are often ritualized verification exercises in which the myths of science as fact and sets of rational scientific process skills are perpetuated.

The previous shows problems with how 'the laboratory of social science' is implemented by the Explore Data assignments. In adopting the laboratory from science education, 'the laboratory of social science' seems to have taken on board well-known problems in laboratory work.

The implementation of the laboratory of social science will subsequently be related a broader research context. The review of the literature exposed several observations and recommendations for ICT in citizenship. Earlier, three strands of theorising about citizenship education were presented, namely education 'about', 'through' and 'for' citizenship (Blyth, 1984). These strands stand for a content-led approach, a process-led approach and an approach combining both content and processes. Up until now, much effort has been on ICT applications supporting the 'education about citizenship' strand, by delivering citizenship content (Selwyn, 2002; Whitworth & Berson, 2003). It is suggested that creative solutions will follow the 'education for citizenship' strand, implying that part of the work should be inquiry-based. This require that certain activities must be learnt, such as hypothesising, locating and analysing evidence and drawing implications of findings (Reynolds, 2001). The inquiry process is characterised by being recursive in nature.

The work with the Explore Data assignments differs from the activity Reynolds (2001) describes, by already having located the evidence: The variables for tabulation in NSDstat for Web are fixed. When moving on to subsequent assignments, variables are still fixed, disallowing an inquiry process to be recursive in nature. Thus, the students' work cannot be described as inquiry-based. The assignments do portray critical thinking skills, but students cannot properly put them to use.

By conveying statistical facts instead of supporting an inquiry-based process, the Explore Data assignments follow the 'education about citizenship' strand. In this regard, the Explore Data assignments are just another addition to a succession of ICT applications promoting content.

There are various examples of learning environments that support combining content and processes. De Jong and partners (e.g. de Jong & van Joolingen, 1998) have been occupied with the field of inquiry learning to facilitate scientific discovery for students. Through simulation, an 'exploratory' setting is offered in which learners are allowed to interact with an object of study. This is comparable to NSD's conception of S-vev and the laboratory of social science; that S-vev is a setting where students can explore the 'raw material' of social science. In inquiry learning, a learner 'must be able to state hypotheses, design experience and draw conclusions from these experiments' (de Jong & van Joolingen, 1993). Recognising that these study processes have proven to be problematic for many students, especially hypothesis generation, de Jong and partners have tried out different software instruments that are offered to the learner in order to support the process of hypothesis formation (de Jong & Njoo, 1993; de Jong & van Joolingen,

1993). These tools are designed from a more cognitive perspective. Nonetheless, similar tools may prove useful in learning environment designed with attention to the sociocultural.

There are also more open learning environments within CSCL. For example, CSILE is a database environment where students themselves produce and share content (Scardamelia & Bereiter, 1996). The learning environment enables students to comment on each other's postings, or organising notes into more complex informational structures. The idea is to use the database within a community to facilitate communal knowledge-building. The learning environment has provisions encouraging a process of inquiry. An example is a discussion note asking students to frame their inquiry in light of a problem rather than a topic.

Järvelä et al. (2004) state that recent studies reveal that in connection with corresponding pedagogical practices, CSCL learning environments can facilitate what the researchers call 'higher-level cognitive achievements' at school. They state that a possible explanation for successful results is both the technological infrastructure together with teacher guidance for engaging students in a process of generating their own research questions, setting up and improving their intuitive theories and searching scientific information as well as sharing their cognitive achievements. One of the challenges for facilitating inquiry in CSCL is 'encouraging students themselves to take on responsibility for cognitive (e.g., questioning, explaining) and metacognitive (e.g., goal-setting, monitoring, and evaluating) aspects of inquiry' (p. 126).

Although inquiry can have a part in teaching, there is in some measure a contradiction between the terms instruction and inquiry. Support for inquiry by digital learning resources is not straightforward. Puntambekar and Kolodner (1998) point out that scaffolding needs to be *distributed* across various agents that play a role in learning (for example the teacher, fellow students, software and other tools). Not all of the scaffolding can be provided with any one tool, the scaffolding must relate to the wider situation and activities. Strijbos, Kirschner and Martens (2004) hold that the design of CSCL settings is probabilistic instead of causal. They state that the question is not what educational techniques and collaborative work forms cause, it is rather what they actually afford. In this context, it is more salient that interaction analytic studies can contribute to revealing affordances present in activities.

11.4 Conclusions

The findings from the two phases in the current study were related in the beginning of this chapter. On the background of the findings, and the relations between the findings, the following conclusions can be made. The pedagogy NSD has stated for S-vev, proclaim that instead of digesting ready-made knowledge, students will themselves take control over content. In the Explore Data assignments, it is true that students produce statistics themselves. However, since the variables are fixed, the statistics are in reality presented by NSD. Therefore, the pedagogical

design of the resources turns out to be what might be called a creative way of conveying content. In this respect, it is not 'creative pedagogical solutions' that are active in the students' work with Explore Data. One may not expect discrepancy between stated pedagogy and resources. Yet, Land and Hannafin (2000) state that such discrepancy is not uncommon for learning environments called constructivist and student-centred.

S-vev's interactive opportunities are not accentuated in the Explore Data assignments. The analysis shows that NSD dictated which dependent and independent variables to apply. In this manner the students' formulation of a hypothesis is limited to what they think the outcome of a given cross-tabulation will be, instead of that the hypothesis can be the starting point of self-governed analyses. The result makes a palish version of NSD's original vision of the student as a social science researcher. The current design could equally well have been implemented with an ordinary textbook containing assignments and a limited table appendix.

The design that predetermines variables has two main implications for the work with Explore Data assignments. First, as one of the student groups' work illustrated, the assignments allow for an activity where tables are used to answer initial predictions. Students may decide that they have solved an assignment, even if the grounding of their prediction is not reviewed, and no implications are drawn from the results in the table. This illustrates that the Explore Data assignments do not relate to a wider inquiry.

A second implication of the predetermined variables is that statistical analysis in NSDstat for web is disengaged from reflection. That is, reflection has no consequence for how NSDstat for Web is used. This was illustrated by another student group. The group concentrated on operating NSDstat for Web, without any reflection on the resulting tables. However, the group was able to successfully postpone the reflection to a later class discussion.

NSD states that S-vev can engage students in an exploratory process where they can try the role as social science researchers. This study began by identifying the Explore Data assignments as the main support in achieving this goal. The results of study, however, show that the assignments are pedagogically designed to provide students with citizenship content at the cost of an exploratory process. This makes a discrepancy between stated pedagogy and pedagogical design. Although the literature states that net-based work can provide opportunities for inquiry-based activities, the students' work with the Explore Data assignments cannot be described as part of an exploratory process.

11.5 Research Quality

On initial design choices and generalisability

The current study set out to look for creative pedagogy in practice under optimal conditions. This was an attempt to give a picture of what the work with S-vev can look like under optimal conditions. Schools with adequate computer equipment were selected, and classes that could be expected to have the necessary computer skills. The student groups were selected on the criterion that they were likely to have a task focus. The analyses showed that the groups experienced only limited computer trouble, and that they had a task focus. As for the selection of teachers, the teachers had direct contact with NSD. The observations show that the teachers had an understanding of the S-vev pedagogy, and were able to help students in their work. An example to the contrary is given by Westrum Hvammen (2003). Teachers in her study had a passive role, leaving it to the students to make sense of S-vev. She also found that students did not see the relevance of S-vev to the citizenship subject. For the current study, it can therefore be argued that the efforts to obtain optimal conditions paid off.

As for generalisability, some important findings could be extrapolated from the study. The reflections and operations are to some extent disengaged. As one of the interaction analyses shows, the Explore Data assignments *allow* students to complete the work without reviewing their prediction's grounding. The second interaction analysis illustrates that the Explore Data assignments *allow* students to complete the physical work with NSDstat for Web without reflection. It is not the intention to generalise, and say that other students will take the same approaches to the assignments. Nonetheless, the analyses described the rationality in the students' approaches.

The focus on Explore Data assignments in this thesis has consequences for how implications can be drawn. NSD's pedagogical idea behind S-vev is the laboratory of social science, where students are engaged in an exploratory process. At the outset of this study, the Explore Data assignments were singled out based on a judgement that they are meant to be the main pedagogical support in implementing the laboratory of social science. A presumption in this judgement is that if the laboratory of social science is important to NSD, S-vev should have pedagogical support in implementing it. When the analysis of the Explore Data assignments found that the pedagogical design was suitable for conveying content, rather than supporting an exploratory process, this can have three meanings. For one, the Explore Data assignments are S-vev's main pedagogical support of an exploratory process, but have an insufficient pedagogical design. Alternatively, S-vev may contain other, not so apparent resources in support of an exploratory process. Finally, the idea of the laboratory of social science is misunderstood in this study, or not as important to NSD as it seemed. A relevant point to the initial selection of Explore Data assignments is that praxis shows that the classes used a considerable portion of their time working with Explore Data.

Beginning a discussion on research quality

It is important to stress that an analysis of empirical materials is only an *account*, to lend Garfinkel's (1967) term. The intention of the analyses is not to claim *the* correct interpretation of the empirical material. It is also important to say that the account is informed by a specific theoretical view and a methodology for analysing.

The following will discuss strengths and weaknesses in how the study was conducted. The sociocultural perspective has proved to be flexible. The concepts served the analysis both of a setting on an institutional level, and of a smaller student setting. Ethnography has provided a methodology of pursuing holism in the analyses, integrating them as one area of study. However, the application of ethnography in a multifaceted environment is a challenge to the discussion of the quality of the study.

The variation in types of data gathered and techniques employed may bewilder nonethnographers (Mulhauser 1975), since it makes it difficult to define what an ethnography will or should look like, and thus to judge its quality. Traditionally, from the ethnographer's point of view, the gathering of many different kinds of data has been seen to increase the validity and reliability of the study, and the uniqueness of each setting and each area of study has been thought to require a tailor-made set of methods and techniques. (Wilcox, 1982, p. 460)

The current study's combination of a content analysis and interaction analyses is a strength for validity in the case of S-vev in citizenship. In a review of media research Riffe and Freitag (1996 in Riffe, 1998) showed that it is uncommon to supplement content analysis with a second research method. Riffe (1998) points out that the relevance of a content study will in many cases increase if paired with a study on how it works with the addressees. For example, in the current content analysis identified terms asking students to predict, observe and explain. The interaction analyses demonstrated what students made of these terms in their work.

Reliability relates to the extent to which research findings can be replicated (Berg, 1998). This has relevance for the content analysis. In assessing whether the developed categories fit the Explore Data assignments, it would have been useful to have another researcher code the assignments anew, based on the categories. This has not been done, but it can still be, as the description of the categories is supplied. All the Explore Data assignments are included in the appendix in coded form. In addition, a complete record of the instances in each coding category is included. By looking at the records it is easy to see general characteristics of the instances, and to judge whether the classification makes sense.

Jordan and Henderson (1995) note that videos can obtain high reliability because of the richness and persistence of the data. The video data in this study has been fairly inclusive (Peräkylä, 1997)

of the interaction, since students had little contact with people outside the camera view. I decided to make further efforts for inclusiveness by merging the video data with screen-cam data for the individual students. In retrospect, the kind of interaction analysis performed in this study could not have been accomplished without. Similar processing of data can therefore successfully be repeated by other interaction analysts.

Janesick (2000, p. 393) states that 'validity in qualitative research has to do with description and explanation and whether or not the explanation fits the description. In other words, is the explanation credible?' Giving as full a picture as possible was attempted by including descriptions of the settings, and of the students' overall work with the Explore Data assignments. During the interaction analyses, transcription for almost the entire period of student work was included. According to Wilcox (1982) this helps provide validating evidence in support of the explanation of data.

Validity depends on the accuracy of the description. A concern in this is that much of the data was in Norwegian. Students' utterances, S-vev and other documents have been translated into English for description in this thesis. Since nuances are always lost in translation, the appendix contains many of the citations in Norwegian. Transcriptions are only in English, since the original format is not written, but spoken language on the videos.

Interviews

The interviews were conducted about two months after the recordings of the students' work. This had the advantage that there could be an initial analysis of the videos, and the interviews could be adjusted according to inform the initial findings. In addition, a video clip of analytic interest could be selected for the video review session in each of the interviews.

The interviews were conducted mainly to gain knowledge about background assumptions, and the cultural setting of the students. The students at the sixth-form college had a year of experience with S-vev, and their general understanding of S-vev had presumably not changed much for the two months. The students from the technical college had only used S-vev during the observations. Here, the interview could have benefited from being conducted earlier, so that the students could remember more of what was important in their work. When they started the interview by saying that they did not remember much, they were shown footage of their work on 'fast forward', playing small segments arbitrarily. This aided their memory, and their answers did inform the analysis.

The role of the researcher

Wolcott (1994) notes that there is no such thing as 'unreported' research. Thus, some notes about the role of the researcher are in place.

It is important with openness about the researcher's relation to any stakeholders in the research (e.g. Miles & Huberman, 1994). Through one year of employment at NSD I was taking part in the production of S-vev. My work was mostly coding, I was little involved in the pedagogical design of S-vev. The From Chaos to Knowledge report lists me as a member of the project because I did some graphical work and web design done for the project during the time at NSD. I was not part of the research team, however. Most of the research, including conducting the interviews, is done after I became independent of NSD. The fact that I did not renew my engagement at NSD made me gain more of an outsider view, and it was easier to comply with the ethnographic ideal of combining an insider and outsider view.

The researcher's role in the setting is also important (e.g. Miles & Huberman, 1994). In this study there was little evidence of how my presence influenced the work. It is easier to discuss how the data may have been influenced by what I told the selected groups. The groups were selected in cooperation with the teacher on the criterion that they were likely to have a task focus. They were not aware of this selection criterion, but their task focus may have been strengthened when they were selected, anyway. However, I told the students that I was not measuring their performance, simply how they used S-vev. The students also knew that I was more interested in their work with the Explore Data assignments. Because research has suggested that camera effects wear out over time, it may have been better if they did not know when they were 'on-stage'. However, it is difficult to know the effects this would have on the data.

Influence of the camera

A potential threat to the validity of the data is if the camera changed the nature of the students' activity (e.g. Peräkylä, 1997). Linde (personal communication in Jordan & Henderson, 1995) found that policemen initially substituted euphemisms for profanities in front of the camera, but switched back to profanities as events heated up. A similar, but more principal change could be found in the talk of the students at the technical college:

Jon: ((Has computer trouble)) Some rubbish, these things, aren't they. (4 s) No. Sa::tan.

Ole: ((Makes three 'squirrel' sounds with mouth)) °Not to swear.°

Jon: Huh?

Ole: °Not to swear.°

Jon: Why not?

Ole: ((Inaudible, ca two words))

Jon: No, I do exactly what I use to do. Don't want to play *false he he he*.

Ole: *He *he**, damn good.

In the course of these few utterances, Ole changes position from first trying to keep Jon from swearing, to swearing himself. When Jon says he does not want to play false he explains a principal stand to the camera's influence on their work. His explanation and laughter displays to Ole and to the camera an awareness that their work is supposed to be 'authentic'. Ole's chuckling response comments on this awareness. Nonetheless, by swearing Ole puts Jon's stand of acting 'normal' into practice by no longer cleaning up his language in honour of the camera.

This illustrates how the group in the technical college managed the camera *explicitly*. In the beginning, the students were careful about speaking about personal matters, asking each others who would watch the video. Later, however, they discussed personal matters, gradually coming to trust that the video would not be seen by the 'wrong people'. The fact that they explicitly managed the camera and being recorded is not in itself evidence that the camera changed the nature of their work with S-vev. Even though the students paid less attention to the camera as time went by, their approach to the S-vev work remained.

The group in the sixth-form college seemed to take little notice of the camera; they did seldom look towards the camera, and only on one occasion did they joke about the camera. This may be because they seemed to favour task-related talk over social talk more than the other group.

The previous has attempted to see the study in retrospect, identifying issues relating to design and research quality. The following looks forward, suggesting which implications can be drawn for policy and for future research.

11.6 Implications for policy

This study has shown a discrepancy between the stated constructivist pedagogy of the producer and the pedagogical design of the product. To avoid this in the future, the authorities should demand that tenders are supplied with dummies of the main pedagogical solutions in the product. This way, judgements of pedagogy can be done at an earlier stage.

In the current case, however, a similar discrepancy was found in the constructivist wording and the actual demands in the National Board of Education's formal requirements for the digital learning resources. The National Board of Education could not expect the producers to resolve a conflict they did not resolve themselves. The board seems to have spoken with two tongues; one speaking *pedagogy* and one *politics*. For future initiatives this implies that the authorities should be clearer on (and more conscious about) what is political considerations and what is pedagogical considerations, or better; bring these to harmony.

11.7 Future research

A motivation in this study has been to identify pedagogical resources that support an explorative process, where students, as do social scientists, use statistical data. The study has argued that the Explore Data assignments are where such support could be expected to reside. The goal that students should familiarise with the practice of social scientists is not assessed critically here. Provided such a goal, the students will have to learn to hypothesise, to make inquiries, to know what their results can say and not say and to suggest implications of their findings. The study shows that these things cannot be simply modelled: When working by the template given in the Explore Data assignments, the conducts are not part of an exploratory process.

This finding should not be generalised that NSDstat for Web and the data sets in themselves are of no use in an explorative process. These resources do carry opportunities for an inquiry-based pursuit of data. Therefore, it would be exiting if pedagogical support for such use is developed, but with another design than the current. A starting point for supporting an exploratory process will be that reflection is allowed to influence the direction the inquiry.

12. REFERENCES

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13. APPENDIX

13.1 Transcription Conventions

Symbols	Clarification	Meaning
—	(underscore)	Simultaneous talk, overlapping talk
,	(comma)	Intonation of continuation or enumeration
.	(point)	Closing intonation
?	(question mark)	Question intonation (rising) (or question prosody somewhere in the previous intonation phrase)
-	(hyphen)	Interruption (i.e. interrupted word)
--	(subsequent hyphens)	Interrupted, or decaying utterance
<i>Italics</i>	(italisation of text)	Focus, focal accent
CAPS	(capitalisation of text)	Extra loud volume
° °	(degree signs)	Low voice volume 'sotto voce'. (Encloses relevant part of utterance)
* *	(asterisks)	Pronounced with laughter in the voice. (Encloses relevant part of utterance)
“ ”	(quotation marks)	Encloses words which appears to be quoted from external material, such as paper sheets or web pages.
=	(equal sign)	Immediately latched onto the previous utterance without any pause
(.)	(point in parentheses)	Brief, but noticeable pause ('Micro-pause')
(2s) (7s)	(number of seconds in parentheses)	Longer pause (in seconds)
::	(colons)	Prolongation of sound
((laughter))	(frame of double parantheses)	Nonverbal aspects (here: laughter)
< >	(frame of angle brackets)	Marks during which part of an utterance a certain nonverbal action is carried out. (Encloses relevant part of utterance)

13.2 Documents Collected for Document Analysis

The following list gives an overview of the different documents and texts collected for the document analysis in Phase I.

NSD documents related to S-vev:

- NSD's tenet to the National Board of Education for making one of the digital learning resources (NSD, 2001c);
- the contract between NSD and the National Board of Education for making the digital learning resource (Læringscenteret & NSD, 2001); and
- course material from S-vev courses for teachers.

Press releases and press coverage on S-vev:

- press releases from the Ministry of Church, Education and Research; a press release on 5th of June 2001 announcing the winners of the tender for digital learning resources in citizenship (KUF, June 5, 2001) and one on August 27th 2001, announcing the release of the digital learning resources (KUF, August 27, 2001);
- a press release from the National Board of Education at the release of the digital learning resources on September 1st 2001 (Læringscenteret, 2001, August 28); and
- press coverage, for example a review of the digital learning resources in Norway's second biggest newspaper, Dagbladet (2001).

Official documents:

- the Annual Plan for 2001 on ICT in Norwegian Education (KUF, 2001);
- the Action Plan for ICT in the Education 2000–2003 (KUF, 2000);
- the National Board of Education's call for tenets for digital learning resources including the formal requirements (Læringscenteret, 2001c);
- the general part of the National Curriculum (KUF, 1997); and
- the part of the National Curriculum specialised for citizenship (KUF, 1994).

Documents related to NSD's presentation of S-vev, their self-presentation and their stated pedagogical platform:

- the NSD web site (NSD, 2003);
- S-vev itself, especially the 'About S-vev' page and the 'Teacher's pages';
- the presentation of S-vev in NSD's periodical following the launch of S-vev (NSD, 2001b);
- NSD's annual report of 1999 (NSD, 2000); and

- a paper on ‘the laboratory of social science’ (Ryssevik, 1994).

Documents related to the project From Chaos to Knowledge:

- the application for funds for pilot study in the ITU From Chaos to Knowledge project (NSD, 1999); and
- ITU report on the From Chaos to Knowledge project, entitled ‘The students in the researcher role: Experience gained from the use of the laboratory of social science’ (Enger & Wilhelmsen, 2003, my translation).

13.3 Citations in Original Norwegian Language

Page 4

Satsningen på digitale læremidler skal stimulere læremidler som fremmer kreative pedagogiske løsninger, tverrfaglighet og arbeidsmåter i tråd med intensjonene i læreplanverkene for grunnskole og videregående opplæring. Læremidlene skal bidra til en mer fleksibel og tilpasset opplæring og fremme aktiv læring. Videre skal likestilling med hensyn til kjønn, bosted, sosiale forhold og språk ivaretas. Dette er overordnede mål som skal styre utviklingen av digitale læremidler i denne perioden.

Page 4

Norsk Samfunnsvitenskapelig Datatjeneste skal utvikle en nettressurs som stimulerer til elevens rolle som forsker. Nettressursen skal kunne brukes selvstendig eller som supplement til andre læremidler. Nettressursen vil tematisk dekke alle de fem hovedmålene i den aktuelle læreplanen.

Målsettingen er å lage en meningsfull ramme for bruk av IKT, samt å stimulere til å ta denne i bruk. Den pedagogiske ideen er at eleven i møte med dataressurser og kilder, gjennom selvstendig arbeid og eksperimentering, skal tilegne seg kunnskap og forståelse om det samfunnet de lever i. Innenfor de fem hovedområdene tjenesten er delt opp i, vil det tilbys et undervisningsopplegg med innledende tekster og problemstillinger. Eleven vil tilbys et verktøy for å utforske og analysere data som spenner fra alle verdens land til kommuner i Norge. Det vil også tilbys en plattform for samarbeid mellom skoler med muligheter for å gjennomføre egne spørreundersøkelser, samt egne ressursider for lærerne.

Page 10

‘gjøre det mulig for elevene å ta del i en prosess der kunnskap blir skapt gjennom innsamling og analyse av relevant informasjon.’

Page 15

‘Norge har lange demokratiske tradisjoner å ta vare på. Et moderne og levende demokrati forutsetter evne til kritisk tenkning, deltakelse og engasjement fra det brede laget av befolkningen. Her har skolen en viktig og utfordrende oppgave.’

Page 15

‘Gjennom faget samfunnslære skal elevene skaffe seg kunnskaper om hvordan samfunnet fungerer, og hvordan de selv kan bidra til å forme framtiden.’

Page 15

‘ha innsikt i politikk og samfunnsliv for å kunne ivareta og videreutvikle vårt demokrati’

Page 49

Formuler en hypotese (påstand om en sammenheng) som sier noe om...

Formuler noen tanker om sammenhenger mellom...

Tror du det er...

Page 50

På hvilken måte tror du at religiøsitet henger sammen med syn på kjønnsroller? Lag en krysstabell der du velger RELIGIØSITET som uavhengig variabel og KJØNNSROLLER som avhengig variabel. Var forbindelsen slik du trodde?

Tror du det er jenter eller gutter som mobber mest? Lag en krysstabell der du bruker SJØLV MOBBA ELLER IKKJE som avhengig variabel og KJØNN som uavhengig variabel.

Page 50

Hva viser tabellen?

Hvordan er sammenhengen?

Se på summen...

Page 50

Du skal nå gjøre det samme som i oppgave 1. Nå skal du selv formulere hypotesen, og du skal bruke SEX SAMME KJØNN som avhengig variabel. Hvordan er endringene?
Stemmer hypotesen din?

Page 51

Blir hypotesen bekreftet eller blir den avkreftet?

Var sammenhengen slik du trodde?

Stemmer hypotesen din?

Page 51

Hvordan vil dere forklare dette resultatet?
Hvordan vil du tolke tabellene?

Page 51

Kommenter resultatet
Kommenter det du leser ut av tabellene eller figurene
Skriv en kort kommentar til tabellen

Page 51

Finn ut om gutter og jenter fremdeles har ulike oppfatninger om de politiske partiene. Bruk variablene som måler om en misliker eller liker de forskjellige partiene som avhengige variabler sammen med KJØNN som uavhengig variabel. Du kan bruke Skolevalgsundersøkelsen 2001 eller Skolevalgsundersøkelsen 2003.

Page 52

Vil personer med homofile i vennekretsen være mer positive til at homofile også kan være gode omsorgspersoner for barn? For å studere om det er en sammenheng må du lage en krysstabell mellom variabelen LESBISKE FORELDRE som avhengig variabel og variabelen HOMOFILE VENNER som uavhengig variabel. ...

Page 55

‘Expect’:

Tror du det er jenter eller gutter som blir mest mobbet? Grunngi hvorfor du tror som du gjør.

‘Generate’:

Lag en krysstabell der du bruker KLASSESTEG som uavhengig variabel og MOBBA ELLER IKKJE som avhengig variabel.

‘Examine’:

Hvordan er sammenhengen?

‘Verify’:

Stemmer resultatene med det du tenkte deg på forhånd?

‘Explain’:

Hvordan vil du forklare sammenhengene?

‘Comment’:

Kommenter det du leser ut av tabellene eller figurene.

Page 57

Tanken er å utnytte elevens naturlige nysgjerrighet og forskertrang, med pedagogisk forankring i det NSD kaller “det samfunnsvitenskapelige laboratorium” (Norsk Samfunnsvitenskapelig Datatjeneste 2000). NSD tenker seg at S-vev skal fungere som et laboratorium slik vi kjenner det fra naturvitenskapen, men med samfunnsvitenskapelige data.

Page 58

‘stor vekt på å bruke Webens interaktive egenskaper til å skape læringsmiljøer hvor elevene oppfordres til eksperimentering og deltakelse.’

Page 58

Den pedagogiske ideen bak S-vev er å gi elevene kunnskap og forståelse gjennom selvstendig arbeid med kilder og data som beskriver det samfunnet de lever i. Målet er å utnytte elevenes naturlige nysgjerrighet og forskertrang og gi elevene muligheter til å delta i en prosess hvor kunnskap skapes gjennom innsamling og analyse av relevant informasjon.

Page 59

‘Tabeller og grafiske framstillinger i bøker og faktasamlinger er statisk informasjon, der de fleste viktige valg allerede er foretatt.’

Page 60

Lag på samme måte en egen problemstilling og formuler en hypotese. Test hypotesen – hvordan vil du forklare resultatene? Arbeid gjerne flere sammen. (Arbeidsopplegg ‘Siste blås for utestedene’)

Page 60

Dersom du har andre problemstillinger som du synes er interessante, presenter dem for de andre i klassen. (Arbeidsopplegg ‘Kongedømme eller republikk?’)

Page 60

1. Før du starter med å lage tabeller og/eller figurer skal du formulere noen enkle hypoteser om sammenhenger du venter å finne mellom religiøsitet og holdning til samliv og samlivsbrudd.

2. Ta utgangspunkt i variablene FORELDRE HOLDE SAMMEN og GIFTE HOLDE SAMMEN, og bruk religiøsitet som uavhengig variabel. Hvordan er sammenhengen? Hvordan vil du forklare sammenhengene? Ble hypotesene dine bekreftet eller avkreftet?

Page 61

‘Hvordan tror du forholdet mellom partipreferanse og EU-standpunkt er?’

‘I hvilket land er en mest skeptisk til å ha folk av annen rase i nabolaget, og i hvilket land er en minst skeptisk?’

Page 62

Norsk samfunnsvitenskapelig datatjeneste AS (NSD) er et serviceorgan for norsk forskning. Hovedformålet er å yte tjenester til forskere og studenter når det gjelder innsamling og tilgang til data.

Page 62

Prosjekter som tildeles støtte kan være prosjekter som erstatter eller supplerer den tradisjonelle læreboka ved å:

- Gjøre læreboka elektronisk.
- Tilby temarelaterte interaktive komponenter som kan brukes som et tillegg til den tradisjonelle læreboka eller et annet digitalt læremiddel.
- Erstatte den tradisjonelle læreboka ved tematisk å dekke læreplanens mål. Slike prosjekt kan legge til rette for en helhetlig læringssituasjon for eleven hvor blant annet tverrfaglig og prosjektorientert tenkning inngår. Læremiddelet kan også inneholde administrative og pedagogiske verktøy til bruk for elever og lærere.

Page 62

Læringsmiljøet skal framstå som en enhetlig og integrert samling interaktive komponenter som tematisk vil dekke alle målene i læreplanen.

Page 85

[Assignment text:] **1. I datasettet vil du se at det er stilt spørsmål om en lang rekke grupper i samfunnet. Finn ut hvilken gruppe ungdommene i minst grad ville like å ha til nabo?**

Svar:

	Frekvens	% av alle
Ikke avmerket	63	21,2
Ville ikke like	234	78,8
Total :	297	100,0

Det var rasister ungdommer minst ville ha til nabo. Det var nesten 80% av de spurte som ikke ville ha rasister i deres nabolag.

Page 86

[Assignment text, pasted and edited:] **2. Er det forskjeller på holdningene til jenter og gutter?**

Jeg tror at guttene faktisk har dårligere holdninger til innvandrere, og vil i mindre grad ha dem som nabo. Grunnene til dette er vanskelig å vite, men det kan ha med at gutter kanskje er mer drastiske i uttalelsene sine og kanskje i større grad tør å si sin egentlige mening.

Svar: Guttene var mest intolerante til alle de forskjellige 'nabotypene', utenom rasister...

Page 87

[Assignment text, pasted and edited:] I hvilket av de følgende land tror du at tilliten til FN er størst: i USA, Mexico, Australia, Norge, Nigeria, India eller Russland. Grunngi hvorfor du tror tilliten er spesielt stor i dette landet.

Hypotese: Vi tror Norge har stor tillit til FN pga de har mye gjøre med FN og FN har også stor tillit til Norge som en fredsbevarende nasjon. FNs visegeneralsekretær er norske Terje Rød Larsen.

	USA	Mexico	Australia	Noreg	Nigeria	India	Russland	Total
Stor tillit	9,6	14,4	10,4	11,2	38,7	18,6	14,7	18,9
Nokså stor tillit	40,3	37,0	40,0	62,2	35,0	36,8	46,3	41,2
Ikkje så stor tillit	36,5	24,1	38,0	24,0	18,1	27,1	25,6	27,2
Ingen tillit	13,7	24,5	11,7	2,7	8,2	17,5	13,4	12,7
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
N=	1421	1487	1954	1110	2612	1060	1442	11086

Her ser vi at Nigeria har klart størst tillit til FN med sine 38,7 %, men hvis vi ser på nokså stor tillit og stor tillit til sammen kommer Norge og Russland opp på Nigeria sitt nivå og vi kan egentlig si at tilliten til FN i Norge er veldig stor.

[Assignment text, pasted:] 2. Lag en krysstabell der du bruker PARLAMENT som avhengig variabel og LAND som uavhengig variabel. Sammenlign denne tabellen med den du laget i oppgave 1. Kan vi si at FN har stor tillit blant folk i de ulike landene når vi sammenligner med den tilliten de har til det nasjonale parlamentet? I hvilke land har folk større tillit til FN enn til det nasjonale parlamentet?

	USA	Mexico	Australia	Noreg	Nigeria	India	Russland	Total
Stor tillit	3,4	10,9	3,8	6,4	17,2	14,1	1,8	8,8
Nokså stor tillit	26,4	32,3	26,7	63,0	19,6	51,3	20,8	31,6
Ikke så stor tillit	56,8	30,9	53,9	28,4	34,2	23,1	45,1	39,4
Ingen tillit	13,4	25,9	15,6	2,1	28,9	11,5	32,3	20,2
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
N=	1460	1447	1998	1117	2611	1665	1877	12175

Denne undersøkelsen viser at det er utrolig stor politiker forakt osv... [sic]

SAMFUNNSLÆRE BLOKKDAG 6/3

- Gjennomgang av resultatene fra i går. (over) Korleis var det å jobbe med S-vev?
- 2, 3 og 4 time: jobbe med S-vev**
- Gjer først ferdig **oppgåvene til arbeidsopplegget vi heldt på med i går** (Kulturer kolliderer). På den siste oppgåva skal de velje ein faktor som kan vere med å påverke haldning til innvandring. Oppgåva skal presenterast for dei andre på slutten av økta. Vi deler arbeidet slik: **Name 1 og Name 2** konsentrerer seg om variabelen **ALDER**, **Name 3, Name 4 og Name 5** jobbar med variabelen **UTDANNING**, **Name 6 og Name 7** jobbar med variabelen **SOSIOØKONOMISK STATUS**, **Name 8 og Name 9** jobbar med variabelen **LANDSDEL**. **Jon and Ole** kan velje ein av dei 4...

Les tekstene, og gjør oppgavene til dette arbeidsopplegget. Noter i stikkordsform på hver oppgåve, vi oppsummerer muntlig i morgen (onsdag). I de oppgavene der dere skal bruke NSDstat, kan dere klippe og lime tabellene dere lager til Word. Ta en utskrift, og ta denne med onsdag.

13.4 Documentation for the Content Analysis

13.4.1 Records of category instances

This section presents the record for each coding category. The definition of each coding category is also presented. The definitions were developed during the work with the text, and had a hermeneutical relationship to the cases actually included. All instances coded with a particular category are listed below the category headline. It is thus easy to find general characteristics of the instances, and to judge whether the classification makes sense.

'Expect' instances

The category contains instances which in a concrete way ask the students to make an expectation.

Hvordan tror du forholdet mellom

Formuler en hypotese (påstand om en sammenheng) som sier noe om

Nå skal du selv formulere hypotesen

Formuler hypoteser

Før du starter med å lage tabeller og/eller figurer skal du formulere noen enkle hypoteser om sammenhenger du venter å finne

Lag en problemstilling og en hypotese som sier noe om

Lag en problemstilling og en hypotese som sier noe om

På hvilket klassetrinn tror du mobbing er mest vanlig, i sjette klasse, åttende klasse eller tiende klasse

Tror du det er jenter eller gutter som blir mest mobbet? Grunngi hvorfor du tror som du gjør

Tror du det er jenter eller gutter som mobber mest

Formuler en påstand om en sammenheng

Hvilke sammenhenger venter du å finne

Igjen – hva tror du er resultatet? Formuler på ny noen påstander om sammenhenger, og se om du får rett

Tror du ungdommens organisasjonsdeltakelse er høyere eller lavere enn i hele befolkningen

Lag på samme måte en egen problemstilling og formuler en hypotese

Tror du folk er mest positive til homofili i USA, Norge eller India

I hvilket av disse sju landa tror du religion er mest viktig? Hvorfor tror du religion står sentralt i dette landet

Hvor tror du folk har det mest liberale synet på seksuell frihet

Hvilken religion tror du

grunngi hvordan du tror denne [variabelen] henger sammen med

Skriv ned hva du tror før du går inn i datamaterialet for å finne svaret

Igjen bør du skrive ned hva du tror før du går inn i datamaterialet

Formuler en hypotese (påstand om en sammenheng) som sier noe om

lag en hypotese om sammenhengen mellom

På hvilken måte tror du at religiøsitet henger sammen med

Tror du muslimer i større grad synes religion er viktig enn folk fra andre trossamfunn? Grunngi svaret ditt

Formuler noen tanker om sammenhenger mellom

Formuler noen tanker om sammenhenger mellom

Formuler noen tanker om slike sammenhenger

Lag en eller flere hypoteser om sammenhenger og velg ut uavhengige variabler for å teste hypotesene

Tror du det er en vanlig oppfatning i Norge

I hvilket av de følgende land tror du at tilliten til FN er størst: i USA, Mexico, Australia, Norge, Nigeria, India eller Russland. Grunngi hvorfor du tror tilliten er spesielt stor i dette landet. Det heter å lage en hypotese eller en antakelse om en sammenheng

I hvilket av disse landene tror du

'Find out' instances

The category contains instances with expression 'find out' ('finn ut' in Norwegian). A couple of instances with the word 'examine' ('undersøk' in Norwegian) seemed to fill the same function as the 'find out' instances and was also included.

Finn ut

Finn ut om

Finn ut

Finn ut

Finn ut

finn ut

Finn deretter ut

Undersøk om

finne ut

Undersøk

Finn ut

Finn ut

Finn ut

Finn ut av dette ved å

'Generate' instances

This category contains instances that request statistical operations.

Lag en tabell/figur som viser sammenhengen mellom

Lag en tabell/figur som viser sammenhengen mellom variablene

Sammenlign variabelen

Se deretter på frekvensfordelingen på variabelen

Lag en krysstabell mellom

Bruk variablene

Lag en krysstabell mellom

Lag en krysstabell mellom

Lag deretter en tabell som tester hypotesen. (Tips: Bruk variabelen

Lag en tabell eller en grafisk framstilling der avhengig variabel er

Deretter lager du en tabell

Bruk variabelen

Velg ut tre eller fire valg

bruk

lag en krysstabell

Undersøk om
Sett også her søkelyset på
Bruk krysstabeller
Bruk nå
Studer sammenhengen mellom variabelen
Bruk variabelen
Lag en tabell/figur
du skal bruke
gjør de samme analysene som i oppgave 1 og 2
Ta utgangspunkt i variablene
lag figurer med
Lag deretter en lignende tabell eller figur
Lag deretter en lignende tabell eller figur
Lag en krysstabell der du bruker
Bruk
Lag en krysstabell der du bruker
Lag en krysstabell der du bruker
Lag en krysstabell der du bruker
Bruk datasettet
velg
studer frekvensfordelingene til variablene
Lag først en krysstabell mellom variablene
Lag en frekvenstabell
For å studere om det er en sammenheng må du lage en krysstabell mellom variabelen
For å finne ut dette må du utføre de samme analysene med variabelen
Bruk disse
finn tall for
finn tall for
Lag tabeller med
Vi kan bytte ut kjønn og se om organisasjonsdeltakelse varierer med valg av STUDIERETNING
Lag en tabell med
gjør en deskriptiv analyse
gjør en deskriptiv analyse
Nå skal du bruke de seks variablene
Lag en tabell/figur med variabelen
Lag deretter tabeller/figurer med variablene
Lag deretter de samme tabellene/figurene som i oppgave 2, men nå skal du bruke variablene
Lag en tabell/figur
Lag deretter tabeller/figurer
Lag en tabell
Lag deretter en tabell eller en grafisk figur
Lag tabellene – bruk også grafikk og lag overstilte søyler
Lag først tabeller der du ser på sammenhenger mellom
Bruk analysetype Deskriptiv, og oppgi variablene
Gjør det samme
Bruk disse variablene i tilsvarende analyser
Bruk denne variabelen
Du kan enten lage tabeller eller søylediagram

Bruk variabelen
Bruk variabelen
Bruk
Du kan enten lage tabeller eller søylediagram
Bruk
Bruk
Lag krysstabeller med variabelen
Lag en krysstabell mellom
Velg ut en av disse faktorene
Gjør tre analyser; først bruker du
Bruk
Bruk
Bruk variabelen
Lag deretter den nye tabellen
Lag toveis tabeller
Gå først videre med den uavhengige variabelen
Ta så for deg de andre uavhengige variablene
ta for deg variabelen som spør om
Lag en krysstabell der du bruker
Lag en krysstabell der du velger
lage en krysstabell
Lag en krysstabell
Lag deretter krysstabeller eller grafiske framstillinger
Lag deretter to tabeller
Lag deretter to tabeller
Lag deretter krysstabeller eller grafiske figurer
Bruk variabelen
Lag først en krysstabell med
Lag en krysstabell med
Lag tre krysstabeller
kan du lage en tilsvarende tabell
Lag en tilsvarende tabell som den du laget i oppgave 1
Lag en krysstabell der du bruker
Lag en deskriptiv analyse der du bruker
Lag en deskriptiv analyse der du bruker
Lag en deskriptiv analyse der du bruker
lage en krysstabell
Lag en krysstabell der du bruker
Lag en krysstabell med
lage en krysstabell
Bruk analysetypen deskriptiv og lag en tabell for hver avhengig variabel.
Lag en tabell eller figur
Lag deretter to nye tabeller eller figurer med variabelen
Lag en tabell eller figur med variabelen
Lag en tabell eller figur
Lag deretter to nye tabeller eller figurer med variabelen

'Examine' instances

The category contains instances where the students are directly asked to examine a statistical outcome, either in general or for a specific feature.

Hva viser tabellen?
Hvordan er denne sammenhengen
Er det en sammenheng
sammenlign tallene til slutt
sammenlign tallene til slutt
Hvordan er endringene
Hvilke endringer registrerer du,
Hvordan er sammenhengen
Hvilke sammenhenger finner dere
Sammenlign resultatet i denne tabellen med resultatet fra miniundersøkelsen
Hvordan fordeler svarene seg?
Er sammenhengen den samme for begge de avhengige variablene
Hva viser diagrammet
Hva finner du
Se på summen
Se på summen
Sammenlign resultatene dine fra oppgave 1 og oppgave 2
Er det forskjell på gutter og jenter?
Sammenlign disse tabellene/figurene med tabellen/figuren du laget i oppgave 1
Hva forteller tabellene/figurene deg
Sammenlign disse tabellene/figurene med tabellen/figuren du laget i oppgave 4
Har det skjedd noen endringer fra 1992 til 2001, eller er forholdene de samme?
Finner du noen mønstre
Hvilket mønster ser du
Har mønsteret forandret seg
Hvordan er sammenhengen her
se hvordan den henger sammen med de tre avhengige variablene
Finner du noen forskjeller mellom menn og kvinner når det gjelder synet på innvandrere
Hvordan har svarene her endret seg over tid
Hvor stor del svarer svært viktig i hver trosretning
Har folk flest svart annerledes enn skoleelevene
Hvordan har frekvensfordelingen endret seg fra 1997 til 2001
Hvordan vil du tolke dette resultatet
Sammenlign tallene i kolonnen Sum.
Hvordan vil du tolke resultatet
Sammenlign summene
Sammenlign denne tabellen med den du laget i oppgave 1
Ser du noe mønster

'Explain' instances

This category contains instances asking for an explanation on the statistical outcome.

Hvordan vil dere tolke og forklare resultatene
hvordan vil du forklare de forskjellene du finner
Hvilke konklusjoner vil du trekke av de sammenhengene du finner i tabellene
Hvordan vil dere forklare dette resultatet
Forsøk å finne forklaringer på de forskjellene
prøv å finne forklaringer på de resultatene
Hva tror dere er årsakene til de mønstrene som dere avdekker
og hva forteller det deg
Hvordan vil du forklare sammenhengene
Hvordan vil du tolke tabellene
Diskuter mulige årsaker til disse forskjellene
Diskuter hva som kan ligge bak disse forskjellene
hvordan vil dere forklare de variasjonene dere finner
hvordan vil dere i så fall forklare forskjellene
hvordan vil du forklare de funnene du gjør
Hva forteller dette om utviklingen i norsk jordbruk
Hvilke resultater finner du
hvordan vil du forklare resultatene
forsøk å finne forklaringer på de variasjonene du observerer
hvorfor tror du resultatet ble slik
Hva kan forklare dette
Hva kan forklare dette
Hvordan vil du tolke disse resultatene
drøft om det er bra for miljøet at levestandarden øker
Hvordan vil du forklare dette resultatet

'Verify' instances

The category contains instances that relate to an expectancy the students have been told to make earlier.

Er forholdet slik du trodde?
Stemmer den med hypotesen som du formulerte? Blir hypotesen bekreftet eller blir den avkreftet?
Vurder tabellene eller figurene i forhold til problemstillingen
Var sammenhengen slik du trodde
vurder om endringene har vært slik du trodde
Stemmer hypotesen din
Ble hypotesene dine bekreftet eller avkreftet?
I hvilken grad vil du si at den hypotesen du formulerte på forhånd stemte?
I hvilken grad vil du si at den hypotesen du formulerte på forhånd stemte?
Undersøk om du trodde rett i oppgave 4.
Tolk tabellen og vurder om hypotesen vi formulerte er riktig
Stemmer den påstanden du formulerte
Hvordan samsvarer denne forventningen med det resultatet du ser
Test hypotesen
se om du trodde rett
Test den hypotesen du formulerte ovenfor

Kan du på bakgrunn av disse tre analysene si at du har funnet støtte for det du trodde
Ble resultatet slik du trodde
Ble resultatet slik du trodde
Lag deretter en tabell som
Stemmer den med den hypotesen du formulerte? Blir hypotesen stadfestet, eller blir den avkreftet
Var forbindelsen slik du trodde
Stemmer resultatene med det du tenkte deg på forhånd
Stemmer resultatene med det du tenkte deg på forhånd
Stemmer resultatene med du tenkte deg på forhånd
Stemmer hypotesene
finn ut om du trodde rett
Kontroller hypotesen ved å

'Comment' instances

The category is based on instances with the word 'comment' ('kommenter' in Norwegian).

Lag en kommentar til denne tabellen
Lag en skriftlig oppsummering
Diskuter eventuelle forskjeller
Diskuter resultatene
der du kommenterer tabellene
Skriv en kort kommentar til tabellen
Skriv en kort kommentar til tabellen
Kommenter kartet
kommenter den
Kommenter figuren
kommenter likheter og forskjeller
Kommenter figuren
kommenter likheter og forskjeller
Hvilke endringer mener du har skjedd, og hvilke forhold er de samme
Lag en skriftlig oppsummering av resultatene i tabell 3 og figur 4
Kommenter resultatet
Kommenter resultatene
Lag en kommentar til denne tabellen
Skriv en kommentar til tabellene/figurene der du legger vekt på å beskrive forskjellene og likhetene
Kommenter det du leser ut av tabellene
Kommenter det du leser ut av tabellene eller figurene
Kommenter det du leser ut av tabellene eller figurene
Kommenter tabellene eller de grafiske figurene
Kommenter de forskjellene du finner
kommenter forskjellene i holdning til EU
Kommenter tabellene eller figurene
Kommenter tabellen eller figuren
kommenter forskjellene i holdning til EU
Kommenter tabellene eller figurene

13.4.2 All Explore Data assignments coded

This section contains all the Explore Data assignments, gathered from the 35 Plans of Work. The assignments are coded with the categories developed through a content analysis. The categories and the colour codes used to highlight instances of them are listed below:

'Expect' category
'Find out' category
'Generate' category
'Examine' category
'Explain' category
'Verify' category
'Comment' category

In S-vev the Plans of Work are divided into five main themes ('søyle' in Norwegian), in the text below the Explore Data assignments appear under their respective 'søyle' heading, and Plan of Work heading. A few Plans of Work have more than one Explore Data section, in the text this is marked by a headings referring to the page each section resides.

SØYLE: Det politiske systemet

Kongedømme eller republikk?

Hent fram undersøkelsen fra 2001 og arbeid videre med den. Gjør oppgavene og undersøk om det fremdeles er slik at politisk interesse påvirker holdningen til kongehuset.

1. Lag en tabell/figur som viser sammenhengen mellom *KONGEHUSET* som avhengig variabel og *POLITISK INTERESSE* som uavhengig variabel. Hva viser tabellen? Hvordan vil dere tolke og forklare resultatene?
Åpne Skolevalgsundersøkelsen 2001 i NSDstat for web
2. Lag en tabell/figur som viser sammenhengen mellom variablene *KONGEHUSET* og *RADIKAL/KONSERVATIV*. Hvordan er denne sammenhengen, og hvordan vil du forklare de forskjellene du finner?
3. Dersom du har andre problemstillinger som du synes er interessante, presenter dem for de andre i klassen.

Sammenlign tabellene eller figurene fra Skolevalgsundersøkelsen i 2001 med tabellene eller figurene fra 1991 som er presentert på disse sidene. Hvilke endringer har skjedd? Hvordan vil du forklare endringene?

Aksjoner

- Fra 1991 til 1997 ligger deltakelsen blant ungdom i demonstrasjoner og aksjoner stabilt på mellom 16-18 prosent. Skolevalgsundersøkelsen 1999 viser imidlertid en økning til 23 prosent. Er dette begynnelsen på en ny trend? Er det slik at ungdom nå deltar mer i aksjoner og demonstrasjoner enn tidligere? For å svare på disse spørsmålene kan du studere variabelen *DEMONSTRASJONER/AKSJONER* i Skolevalgsundersøkelsen 2001. Forsøk å forklare det resultatet du finner?

Åpne Skolevalgsundersøkelsen 2001 i NSDstat for web

- Søk i partienes pressemeldinger på ord som "ulv", "ulvene", "rovdyr" etc., og finn ut hvor de ulike partiene står i konflikten mellom bønder og ulven. Hvilke partier støtter ulven og hvilke partier støtter bøndene? Er det noen partier som forsøker å være på lag med begge parter?
Søk i Pressemeldinger

- Gå til *Utforsk data* under temaet Kjønn og politisk interesse. Der finner du en oppgave som tar for seg tre av de fire kanalene for politisk innflytelse som en gjerne regner med i det norske demokratiet: valgkanalen, aksjonskanalen og organisasjonskanalen. Gjør denne oppgaven.

Demokratiske nyanser

Nå skal du bruke *NSDs Europaundersøkelse 2001* i NSDstat for web:

1. I 1994 var det 47,7 prosent som stemte ja og 52,3 prosent som stemte nei. Finn ut hvordan forholdet mellom ja- og nei-siden har utviklet seg fra 1994 til 2001. Sammenlign variabelen *STEMTE EU 1994* med resultatet av folkeavstemningen. Se deretter på frekvensfordelingen på variabelen *VILLE STEMTE EU NÅ*. Hva er det mest sannsynlige utfallet av en ny folkeavstemning?
Åpne Europaundersøkelsen 2001 i NSDstat for web
2. Hvordan tror du forholdet mellom partipreferanse og EU-standpunkt er?
3. Lag en krystabell mellom *PARTIPREFERANSE* som uavhengig variabel og *VILLE STEMTE EU NÅ* som avhengig variabel. Er forholdet slik du trodde?
4. Se om du kan finne andre interessante forbindelser og presenter disse for klassen.

Parti og partisystem

1. Finn ut om gutter og jenter fremdeles har ulike oppfatninger om de politiske partiene. Bruk variablene som måler om en misliker eller liker de forskjellige partiene som avhengige variabler sammen med *KJØNN* som uavhengig variabel.
Åpne Skolevalgsundersøkelsen 2001 i NSDstat for web
2. Lag en krystabell mellom *RADIKAL/KONSERVATIV* som avhengig variabel og *PARTIVALG-KORT* som uavhengig variabel. La oss si at partiene på venstresida er RV, SV og AP, at partiene i sentrum er SP, KrF og V, og at H og FrP hører hjemme på høyresida. Har elevene stemt i samsvar med sin egen plassering på høyre-venstre-skalaen?
3. Finn ut hvilket parti som vant skolevalget 2001 ved å gå inn på *landsoversikten*. Sammenlign tallene fra 2001 med tallene fra stortingsvalget i 1997. Hvordan har oppslutningen om de forskjellige partiene utviklet seg?
Gå til Landsoversikten for skolevalgsresultatene
4. Lag en krystabell mellom *ØKONOMISK POLITIKK* som avhengig variabel og *PARTIVALG-KORT* som uavhengig variabel. Kan dette saksområdet ha vært avgjørende for hvordan valgresultatet ble?
Åpne Skolevalgsundersøkelsen 2001 i NSDstat for web

Rett eller galt – dødsstraff og kriminalitet – årsaker til kriminalitet

Vi har nå sett at ungdom trolig er mer utsatt for trusler om vold enn eldre mennesker. Vi skal arbeide videre med undersøkelsen *Ungdata – rus og kriminalitet*.

Først skal vi arbeide litt mer med ungdom og trusler om vold. Bruk av alkohol eller narkotika er ofte en medvirkende faktor når vold forekommer. Arbeid med følgende oppgaver:

1. Formuler en hypotese (påstand om en sammenheng) som sier noe om trusler om vold, bruk av alkohol og kjønn. Lag deretter en tabell som tester hypotesen. (Tips: Bruk variabelen *TRUSSEL OM VOLD* som avhengig variabel og *BRUK AV ALKOHOL* og *KJØNN* som uavhengige variabler).
Opne Ungdata – rus og kriminalitet i NSDstat for web
2. Lag en kommentar til denne tabellen. Stemmer den med hypotesen som du formulerte? Blir hypotesen bekreftet eller blir den avkreftet? Kan et rusmiljø og bruk av rusmidler være en faktor som forklarer kriminalitet?

Vold avler vold?

Det er en vanlig påstand at vold avler vold. Denne påstanden kan være et utgangspunkt for en problemstilling. Er det tilfelle at mennesker som oppholder seg i voldelige miljøer oftere deltar i voldshandlinger enn andre? I undersøkelsen *Ungdata – rus og kriminalitet* kan vi undersøke dette. Dersom påstanden ovenfor har noe for seg, så vil det være rimelig å hevde at personer som oppholder seg i miljøer der de opplever vold og voldelige situasjoner, oftere enn andre har vært innblandet i vold.

1. Lag en tabell eller en grafisk framstilling der avhengig variabel er *SLÅSSKAMP MED VÅPEN*, og uavhengig variabel er *VITNE TIL VOLD*. Deretter lager du en tabell der avhengig variabel er *SLÅSSKAMP UTEN VÅPEN*, og uavhengig variabel er *VITNE TIL VOLD*.
Opne Ungdata – rus og kriminalitet i NSDstat for web
2. Vurder tabellene eller figurene i forhold til problemstillingen [problemstillingen] vold avler vold. Er det en sammenheng mellom hvor ofte ungdommer deltar i vold og hvor ofte de er vitne til vold? Hvilke konklusjoner vil du trekke av de sammenhengene du finner i tabellene?

Valg og velger

Du skal nå bruke flere av *skolevalgsundersøkelsene* i NSDstat for web.

1. Finn ut hvordan tilliten til politikerne har utviklet seg i perioden fra 1995 til 2001. Bruk variabelen *TILLIT TIL POLITIKERE* og se kategoriene “meget stor” og “ganske stor” under ett. Noter resultatet for hvert år, og sammenlign tallene til slutt.

Åpne skolevalgsundersøkelsene i NSDstat for web: 1989, 1991, 1993, 1995, 1997, 1999, 2001

2. Finn ut hvordan den politiske interessen har utviklet seg blant ungdommen i perioden fra 1989 til 2001. Velg ut tre eller fire valg, for eksempel 1989, 1995, 2001, og se hvordan svarfordelingen på variabelen *POLITISK INTERESSE* har utviklet seg. Det kan være en fordel å se kategoriene “meget” og “ganske interessert” under ett. Noter resultatet for hvert år, og sammenlign tallene til slutt.
3. Velg ut tre valg og finn ut om gutter er mindre interesserte i politikk enn jenter. bruk *POLITISK INTERESSE* som avhengig variabel og *KJØNN* som uavhengig variabel.
4. Kan du tenke deg en faktor som kan påvirke den politiske interessen hos ungdommen? Se om du finner en variabel i skolevalgsundersøkelsen 2001 som kan uttrykke denne faktoren, og lag en krysstabell med *POLITISK INTERESSE* som avhengig variabel og den variabelen du har funnet som uavhengig. Var sammenhengen slik du trodde?

Nå skal du bruke *Nasjonal meningsmåling skolevalg* for årene 1995, 1997, 1999 og 2001 i NSDstat for web.

5. Hvordan har tilliten til politikerne utviklet seg i folket? Gjør på samme måten som i oppgave 1 ovenfor.

Åpne Nasjonal meningsmåling skolevalg i NSDstat for web: 1989, 1991, 1993, 1995, 1997, 1999, 2001

6. Er det forskjeller mellom elevene og folket?

Fordypning: Ungdom og politikk

Side 3

Tabell 2 viser at flere gutter enn jenter oppgir at de er meget eller ganske interessert i politikk. Forskjellene er likevel ikke så store, og det er faktisk også flere gutter enn jenter som overhodet ikke interesserer seg for politikk. **Hvordan vil dere forklare dette resultatet?** Variabelen *STEMMERETT/DELTADELSE* dreier seg om hvorvidt ungdommene har tenkt å bruke stemmeretten ved neste valg. Spørsmålet handler med andre ord om deltakelse i valgkanalen. **Undersøk om** jentene og guttene har svart forskjellig på spørsmålet. **Forsøk å finne forklaringer på de forskjellene** som eventuelt kommer fram. Bruk enten datamaterialet fra Skolevalgsundersøkelsen 1999 eller fra Skolevalgsundersøkelsen 2001.

Skolevalgsundersøkelsen 1999
Skolevalgsundersøkelsen 2001

Variablene *UNDERSKRIFTSLISTER* og *DEMONSTRASJONER/AKSJONER* knytter seg til deltakelse i aksjonskanalen. Variablene *MEDLEM I POLITISK PARTI*, *POLITISK FORENING*, *SOSIAL/KULTURELL FORENING* og *RELIGIØS FORENING* kan derimot sies å være mål på deltakelse i organisasjonskanalen. **Sett også her søkelyset på** forskjellene mellom gutter og jenter, og **prøv å finne forklaringer på de resultatene** dere kommer fram til. Bruk enten datamaterialet fra Skolevalgsundersøkelsen 1999 eller fra Skolevalgsundersøkelsen 2001.

Lag en skriftlig oppsummering (1-2 sider) av det dere har funnet ut om problemstillingen kjønn og politikk. Er forholdet det samme for de tre kanalene for deltakelse nevnt ovenfor? **Diskuter eventuelle forskjeller.**

Side 5

Studer sammenhengene mellom de uavhengige variablene *BOSETNINGSTETTHET*, *KOMMUNETYPE*, *FLYTTEBALANSE* og den avhengige variabelen *POLITISK INTERESSE* i NSDstat for Web.

Bruk enten datamaterialet fra Skolevalgsundersøkelsen 1999 eller fra Skolevalgsundersøkelsen 2001.

Tips: **Bruk krystabeller** og velg å ta med kun én uavhengig variabel av gangen.

Diskuter resultatene. Hva tror dere er årsakene til de mønstrene som dere avdekker?

Side 7

Arbeid videre med temaet politisk deltakelse og mediekonsum. **Bruk nå** spørsmålet om hva som er den viktigste kilden til informasjon om politiske saker, variabelen *INFORMASJONSKILDE*.

Bruk enten datamaterialet fra Skolevalgsundersøkelsen 1999, eller fra 1.

Bruker ulike ungdomsgrupper forskjellige informasjonskanaler, eller er medievanene omtrent de samme? Hvilke informasjonskanaler bruker de som er mest interessert i politikk, og hvilke kanaler bruker de som er minst interessert? Bruk enten datamaterialet fra Skolevalgsundersøkelsen 1999, eller fra Skolevalgsundersøkelsen 2001.



Tips: **Studer sammenhengen mellom variabelen** *POLITISK INTERESSE* og variabelen *INFORMASJONSKILDE* i NSDstat for web.

SØYLE: Individ og samfunn

Under samme tak

– bor flere enn en ..., samlivsformer i dag

I de følgende oppgavene skal vi sette fokus på endring i holdninger. Du skal derfor bruke datasettene *Undersøkelse om familie og kjønnsroller 1994* og *Undersøkelse om religion 1998*. Disse skal du åpne i NSDstat for web. Tabellene og/eller figurene du lager, bør du kopiere over i et dokument **der du kommenterer tabellene.**

1. Endringene i holdninger kan være forskjellige i ulike grupper. Religiositet betyr mye for holdningsdanning, og en aktuell hypotese er at sterkt religiøse mennesker i mindre grad enn andre vil endre syn på samboerskap . **Bruk variabelen** *SAMBOERSKAP*  som avhengig variabel, og variabelen *FORHOLD TIL KIRKEN* som uavhengig variabel. **Lag en tabell/figur** for 1994 og en tabell/figur for 1998. Sammenlign tabellene og **vurder om endringene har vært slik du trodde.**

Åpne Undersøkelse om familie og kjønnsroller 1994 i NSDstat for web
Åpne Undersøkelse om religion 1998 i NSDstat for web

2. Du skal nå gjøre det samme som i oppgave 1. Nå skal du selv formulere hypotesen, og du skal bruke *SEX SAMME KJØNN* som avhengig variabel. Hvordan er endringene? Stemmer hypotesen din?
3. Formuler hypoteser, og gjør de samme analysene som i oppgave 1 og 2, men nå skal du bruke *BOSTED* som uavhengig variabel. Hvilke endringer registrerer du, og hva forteller det deg?
4. Gå til Dataressurser, velg partidata og deretter partiprogram. Her skal du gjennomføre et søk med søkeordene “adopsjon” og “homofile”. Undersøk deretter hva de ulike partiene sier om homofiles rettigheter.

Gå til Dataressurser

Hold den hurpa unna meg

– religiøsitet og samlivsbrudd

Vi har til nå sett på hvordan alder påvirker holdningene våre. Du blir nå invitert til et videre arbeid med datasettet fra *Undersøkelse om familie- og kjønnsroller 1994*. Men nå skal du bruke religiøsitet som uavhengig variabel.

1. Før du starter med å lage tabeller og/eller figurer skal du formulere noen enkle hypoteser om sammenhenger du venter å finne mellom religiøsitet og holdning til samliv og samlivsbrudd.
2. Ta utgangspunkt i variablene *FORELDRE HOLDE SAMMEN* og *GIFTE HOLDE SAMMEN*, og bruk religiøsitet som uavhengig variabel. Hvordan er sammenhengen? Hvordan vil du forklare sammenhengene? Ble hypotesene dine bekreftet eller avkreftet?

Opne Undersøkelse om familie- og kjønnsroller 1994 i NSDstat for web

3. I datasettet fra Undersøkelse om familie- og kjønnsroller 1994 finner du en rekke variabler der de spurte kan gi uttrykk for tilstrekkelige grunner for skilsmisse. Ta for dere hver av disse grunnene og lag figurer med *ALDER* og *RELIGIØSITET* som uavhengige variabler. Hvilke sammenhenger finner dere?
4. Disse dataene er fra 1994. Er det grunn til å tro at disse forholdene har endret seg mye fra den tiden, eller er det slik at samfunnsnormene endrer seg så sakte at disse dataene i stor grad også beskriver dagens forhold?

Hvem er vi, hva mener vi?

– barn av vår tid

Vi har sett at religiøsitet er med og bestemmer holdningene våre. Men det er selvsagt bare en av faktorene som har betydning. Det blir hevdet at vi alle er barn av vår tid. Med det mener vi at holdningene våre blir formet i den tiden vi vokser opp. Dersom det er tilfelle skal vi vente at det er sammenheng mellom alder og holdning til samboerskap.

1. Lag en problemstilling og en hypotese som sier noe om [problestilling] holdning til samboerskap og alder.

2. **Lag deretter en lignende tabell eller figur** som vist ovenfor, men nå skal du bruke *ALDER* som uavhengig variabel i stedet for *RELIGIØSITET*.

Åpne Undersøkelse om religion 1998 i NSDstat for web

3. **I hvilken grad vil du si at den hypotesen du formulerte på forhånd stemte?** **Skriv en kort kommentar til tabellen.**

Kjønn og holdninger

Selv om det i vår tid er flere homofile samboere enn tidligere, så er fremdeles de fleste samboersforholdene mellom menn og kvinner. Det kan likevel være interessant om det er forskjell på holdningen til samboerskap mellom menn og kvinner. I de følgende oppgavene skal du forske litt på denne sammenhengen.

1. **Lag en problemstilling og en hypotese som sier noe om** [problemstilling] holdning til samboerskap og kjønn.
2. **Lag deretter en lignende tabell eller figur** som vist ovenfor, men nå skal du bruke *KJØNN* som uavhengig variabel i stedet for *ALDER*.

Åpne Undersøkelse om religion 1998 i NSDstat for web

3. **I hvilken grad vil du si at den hypotesen du formulerte på forhånd stemte?** **Skriv en kort kommentar til tabellen.**

Det gode samfunn – levekår i norske kommuner

Levekår i kommunene

Nå skal du arbeide med datasettet *Levekår*. Åpne datasettet i NSDstat for web og gjør oppgavene nedenfor. Du skal svare på oppgavene i et dokument som du skriver ut og tar med til oppsummeringen i klassen til slutt.

1. Bruk kartfunksjonen i NSDstat for web og lag et kart over ditt eget fylke der du viser levekårsindeksen. Du velger selv hvor mange grupper du skal dele indeksen inn i. **Kommenter kartet.**

Åpne Kart for Levekår i NSDstat for web

2. **Finn deretter ut** hva som er indeksen for din kommune og kommunene rundt. Det kan du gjøre ved på peke på kommunen i kartet i NSDstat for web. Da vil kommunenavnet og indekstallet bli vist på skjermen. Stemmer tallene med ditt inntrykk av egen og de andre kommunene?
3. Velg ut noen av de andre levekårsindeksene og gjør det samme som i oppgave 2.
4. Det er et politisk mål å gjøre levekårene i det norske samfunnet så gode som mulig. Søk på “levkår” i de politiske partienes programmer. Er du spesielt interessert i barn og ungdoms levekår, kan du i tillegg bruke søkeordet “oppvekstvilkår”. Hvilke mål har norske politiske partier når det gjelder levekårene i det norske samfunnet?

Søk i Pressemeldinger

Sa jeg noe dumt nå igjen?

Nå skal du bruke datasettet *Helsevanar blant skuleelevar*. Ei WHO-undersøking i fleire land 1997/1998 (utvalde variablar) i NSDstat for Web til å svare på spørsmålene.

1. I hvilket land trives elevene best på skolen? Lag en krysstabell der du bruker *LAND* som uavhengig variabel og *TRIVSEL PÅ SKULEN* som avhengig variabel. Dersom du vil, kan du presentere resultatet i et søylediagram.

Åpne Helsevanar blant skuleelevar i NSDstat for web

2. I hvilket land er elevene mest fornøyde med livet sitt? Bruk *LAND* som uavhengig og *NØGD MED LIVET* som avhengig variabel.
3. På hvilket klassetrinn tror du mobbing er mest vanlig, i sjette klasse, åttende klasse eller tiende klasse? Lag en krysstabell der du bruker *KLASSESTEG* som uavhengig variabel og *MOBBA ELLER IKKJE* som avhengig variabel.
4. Tror du det er jenter eller gutter som blir mest mobbet? Grunngi hvorfor du tror som du gjør.
5. Undersøk om du trodde rett i oppgave 4. Lag en krysstabell der du bruker *MOBBA ELLER IKKJE* som avhengig variabel og *KJØNN* som uavhengig variabel.
6. Tror du det er jenter eller gutter som mobber mest? Lag en krysstabell der du bruker *SJØLV MOBBA ELLER IKKJE* som avhengig variabel og *KJØNN* som uavhengig variabel.
7. Er de som har røykt og smakt alkohol mer ensomme på skolen enn de som ikke har røykt eller smakt alkohol?

Seksualitet og samliv

Side 2

Dersom du har gjort alt riktig, skal du få opp en enveis tabell som forteller hvor mange som har svart på de ulike alternativene om det er rett eller galt med sex før ekteskapet. Kopier tabellen og lim den inn i et dokument.

Når du leser tabellen vil du legge merke til at den har tre kolonner: *frekvens*, *% av alle* og *% av gyldige*. Under *frekvens* kan du lese hvor mange som har svart på hvert alternativ, under *% av alle* ser du prosentfordelingen for alle og under *% av gyldige* er det prosentfordelingen for bare *de som har en mening*.

1. Sammenlign resultatet i denne tabellen med resultatet fra miniundersøkelsen.
2. Bruk datasettet Religion 1998, internasjonal fil og velg deg ut en eller flere variabler og lag enveis tabeller. Hvordan fordeler svarene seg? Hvordan vil du tolke tabellene?

Åpne Religion 1998, internasjonal fil i NSDstat for web

Side 3

Dersom du har gjort alt riktig, skal du få opp en toveis tabell som viser sammenhengen mellom svaralternativene på variabelen *SEX FØR EKTESKAPET* og aldersgrupper. Kopier tabellen og lim den inn i et dokument.

Når du leser tabellen, vil du legge merke til at på radene nedover i tabellen har vi svaralternativene, og i kolonnene har vi aldersgruppene. Det er alminnelig i tabeller at du finner svaralternativene på den avhengige variabelen radvis, og svaralternativene på den uavhengige variabelen kolonnevis. Tabellen er prosentuert loddrett, det vil si kolonnevis, og dermed kan vi sammenligne gruppene radvis. Dersom

vi for eksempel ser på dem som mener at sex før ekteskapet alltid er galt, så ser vi at andelen øker med alderen.

1. Tolk tabellen og vurder om hypotesen vi formulerte er riktig.
2. Bruk datasettet Religion 1998, internasjonal fil og **velg** *SEX FØR EKTESKAPET* som avhengig variabel og *KJØNN* som uavhengig variabel. **Formuler en påstand om en sammenheng**. Lag tabellen, kopier den inn i et dokument og **kommenter den**. **Stemmer den påstanden du formulerte?**

Fordypning: Holdninger til samliv og kjønnsroller

Side 4

1. Gå inn i NSDstat for web via tabellene 3 og 4. Framstill resultatene grafisk ved bruk av søylediagram.
2. Fortsett i NSDstat for web og **studer frekvensfordelingene til variablene** *FARSROLLEN*, *ANSVAR FOR SYKE BARN* og *ANSVAR BARNAS FRITID* i det samme datasettet, som dreier seg om synet på hvor mye ansvar kvinner og menn bør ha når det gjelder ulike oppgaver i hjemmet.

Åpne Undersøkelse om familie- og kjønnsroller 1994 i NSDstat for web

3. Vi har sett at det ikke er så store forskjeller når det gjelder mennenes og kvinnenes holdninger til tradisjonelle kjønnsroller. **Undersøk om** en av de andre uavhengige variablene, alder, spiller en større rolle. **Lag først en krysstabell mellom variablene** *KVINNEROLLEN* og *ALDERSGRUPPER*. Gjør deretter det samme mellom variablene *KJØNNSROLLER* og *ALDERSGRUPPER*. Har alder noe å si for synet på tradisjonelle kjønnsroller? **Er sammenhengen den samme for begge de avhengige variablene?**

Side 6 (a)

1. Vil barn ta skade av å vokse opp med to personer av samme kjønn? I variabelen *LESBISKE FORELDRE* er det spurt om barn vil ta skade av å vokse opp hos to lesbiske kvinner. **Lag en frekvenstabell** i NSDstat for web med denne variabelen. Siden så stor andel av befolkningen er mot at homofile skal få adoptere barn, kan vi også vente at et flertall vil mene at et barn vil ta skade av å vokse opp med to lesbiske kvinner. **Hvordan samsvarer denne forventningen med det resultatet du ser** i frekvenstabellen? **Diskuter mulige årsaker til disse forskjellene.**

Åpne Holdninger til lesbiske og homofile 1998 i NSDstat for web

2. Vil personer med homofile i vennekretsen være mer positive til at homofile også kan være gode omsorgspersoner for barn? **For å studere om det er en sammenheng må du lage en krysstabell mellom variabelen** *LESBISKE FORELDRE* som avhengig variabel og variabelen *HOMOFILE VENNER* som uavhengig variabel. Framstill resultatet som et overstilt

- søylediagram i NSDstat for web. Hva viser diagrammet? Hvor stor andel av de som har homofile i vennekretsen mener at barn ikke vil ta skade av å vokse opp med to lesbiske kvinner?
- Er det flere som mener at barn vil ta skade av å vokse opp med to homofile menn enn med to lesbiske kvinner? For å finne ut dette må du utføre de samme analysene med variabelen *HOMOFILE FORELDRE*. Diskuter hva som kan ligge bak disse forskjellene.

Side 6 (b)

- Undersøkelsen inneholder også følgende bakgrunnsvariabler: *KJØNN*, *ALDERSGRUPPER*, *UTDANNING*, *HUSSTANDSINNTTEKT* og *LANDSDEL*. Bruk disse til å finne ut hvilke grupper i befolkningen som støtter at homofile skal få adoptere barn. Hvem er mest imot at homofile skal ha denne retten? Er forskjellene store mellom menn og kvinner? Hvilken aldersgruppe er mest for? I hvilken landsdel bor de som er mest imot?

Åpne Holdninger til lesbiske og homofile 1998 i NSDstat for web

SØYLE: Arbeids- og næringsliv

Organisasjoner og makt

- Bruk *Skolevalgundersøkelsen 1999* og finn tall for deltakelse i de andre organisasjonstypene, *MEDLEM POLITISKE PARTIER*, *RELIGIØSE FORENINGER* og *KULTURELLE OG SOSIALE ORG*. Varierer deltakelsen i de ulike organisasjonene? Dersom dere finner variasjoner, hvordan vil dere forklare de variasjonene dere finner?

Åpne Skolevalgundersøkelsen 1999 i NSDstat for web

- Gå videre med *Skolevalgundersøkelsen 2001* og finn tall for deltakelse i de andre organisasjonstypene, *MEDLEM POLITISKE PARTIER*, *MEDLEM POLITISKE FORENINGER*, *RELIGIØSE FORENINGER* og *KULTURELLE OG SOSIALE ORG*. Er det forskjell i deltakelse fra 1999? Dersom det er forskjell, hvordan vil dere i så fall forklare forskjellene?

Åpne Skolevalgundersøkelsen 2001 i NSDstat for web

- Videre kan vi jo spørre om det er en sammenheng mellom deltakelse og kjønn. Er jenter mer med i organisasjoner enn gutter, og kan det tenkes at kjønn kan ha innvirkning på hvilken type organisasjoner ungdommen foretrekker? Hvilke sammenhenger venter du å finne? Lag tabeller med *MEDLEMS*-variablene som avhengig variabel, og *KJØNN* som uavhengig variabel.
- Vi kan bytte ut kjønn og se om organisasjonsdeltakelse varierer med valg av *STUDIERETNING*. Igjen – hva tror du er resultatet? Formuler på ny noen påstander om sammenhenger, og se om du får rett!

5. **Tror du ungdommens organisasjonsdeltakelse er høyere eller lavere enn i hele befolkningen?**
Ta utgangspunkt i datasettet *Undersøkelse om arbeidsforhold og arbeidserfaringer 1997* der et representativt utvalg fra hele befolkningen er spurt. **Lag en tabell med MEDLEM AV FORENING** som avhengig variabel og **KJØNN** som uavhengig variabel. Sammenlign ungdommens organisasjonsdeltakelse med befolkningens organisasjonsdeltakelse. **Hva finner du og hvordan vil du forklare de funnene du gjør?**

Åpne *Undersøkelse om arbeidsforhold og arbeidserfaringer 1997* i NSDstat for web

Sin egen lykkes smed

Ingen utforsk data, kun egne undersøkelser.

Ti bønder i byen

Nå skal du arbeide med datasettet *Endringer i norsk jordbruk 1989-1999* i NSDstat for web.

1. Hvordan har tallet på bruksenheter utviklet seg fra 1989 til 1999? Bruk variabelen **DRIFTSENHETER – ENDRING TOTALT 99-89** og **gjør en deskriptiv analyse**. **Se på summen**.
Åpne *Endringer i norsk jordbruk 1989-1999* i NSDstat for web
2. Hvordan har arealet av dyrka mark utviklet seg fra 1989 til 1999? Bruk variabelen **JORDBR. AREAL – ENDRING** og **gjør en deskriptiv analyse**. **Se på summen**.
3. **Sammenlign resultatene dine fra oppgave 1 og oppgave 2**. **Hva forteller dette om utviklingen i norsk jordbruk?**
4. **Nå skal du bruke de seks variablene DRIFTSENHETER – ENDRING 5-49 DKA, 50-99 DKA, 100-199 DKA, 200-299 DKA, 300-499 DKA og 500+ DKA** sammen med funksjonen Kart. Tegn et kart over det fylket du bor i for hver av de seks variablene. Hvordan har utviklinga vært for gårder med ulik størrelse? Se særlig på den kommunen du bor i, eller den nærmeste landbrukskommunen. Hvorfor tror du utviklingen har vært slik?
5. Hvordan har gjennomsnittsalderen til bøndene utviklet seg fra 1989 til 1999 i den kommunen du bor i, eller i den nærmeste landbrukskommunen?

Vi har gjort jobben for regjeringen

Vi har sett hvordan norske ungdommer har rapportert fra sin skolehverdag i 1997/1998. Du kan nå utforske undersøkelsen videre.

1. **Lag en tabell/figur med variabelen TRIVES PÅ SKOLEN** som avhengig variabel og **KJØNN** som uavhengig variabel. **Kommenter figuren**. **Er det forskjell på gutter og jenter?** Åpne “Helsevaner blant skoleelever. Elevenes arbeidsmiljø 1997/1998” i NSDstat for web
2. **Lag deretter tabeller/figurer med variablene PÅVIRKER SKOLEARBEIDET, RETTFERDIGE LÆRERE, LÆRERNE BRYR SEG og HJELP FRA LÆRERNE** som avhengige variabler og **KJØNN** og **KLASSE** som uavhengige variabler. **Sammenlign disse tabellene/figurene med tabellen/figuren du laget i oppgave 1 og kommenter likheter og forskjeller**.
3. **Lag deretter de samme tabellene/figurene som i oppgave 2, men nå skal du bruke variablene TRIVSEL PÅ SKOLEN og LÆRERNE BRYR SEG** som uavhengige variabler. **Hva forteller tabellene/figurene deg?**

Er det slik at norsk skoleungdom har det bedre eller dårligere enn elever i andre land? Det kan du få svar på ved å bruke et annet datasett fra samme undersøkelse. I dette datasettet har vi plukket ut skoleungdom fra syv land: Norge, Danmark, England, Skottland, Østerrike, Hellas og Israel. De ungdommene som er med i dette datasettet, er 11, 13 og 15 år gamle.

4. **Lag en tabell/figur** med variabelen *TRIVSEL PÅ SKULEN* som avhengig variabel og *LAND* som uavhengig variabel. **Kommenter figuren**. I hvilket land trives elevene best, og hvor trives de minst. Åpne “Helsevaner blant skoleelevar. Ei WHO-undersøkning i flere land 1997/1998” i NSDstat for web
5. **Lag deretter tabeller/figurer** med variablene *SKULEN ER KEISAM* og *EINSAM PÅ SKULEN* som avhengige variabler og *LAND* som uavhengig variabel. **Sammenlign disse tabellene/figurene med tabellen/figuren du laget i oppgave 4** og **kommenter likheter og forskjeller**.

Lønn som fortjent?

- et arbeidsopplegg om lønn og lønnsutvikling.

Vi har fått vite at undersøkelsen Holdninger til sosial ulikhet fra 1992 viste store forskjeller mellom menns og kvinners personlige inntekt. Vi har også funnet ut at utdanningsnivået har mye å si for inntektsforskjellene, og at det har noe å si hvor i landet du bor.

Har dette forandret seg fra 1992 til 2001? Vi skal bruke data fra den nasjonale meningsmålingen i forbindelse med skolevalget i 2001 for å studere det nærmere. Lagre tabellene og svarene i et dokument, og diskuter resultatene i klassen etterpå.

1. **Lag en tabell** der *PERSONLIG INNTEKT* er avhengig variabel og *KJØNN* er uavhengig variabel. Lim tabellen inn i et tekstdokument som du lagrer. Åpne Nasjonal meningsmåling skolevalg 2001 i NSDstat for web
2. **Lag deretter en tabell eller en grafisk figur** der *PERSONLIG INNTEKT* er avhengig variabel og *EGEN UTDANNING* er uavhengig variabel, og så en tabell eller grafisk figur der *PERSONLIG INNTEKT* er avhengig variabel og *LANDSDEL* er uavhengig variabel. Lim tabellene eller de grafiske figurene inn i tekstdokumentet du har opprettet.
3. Sammenlign disse tabellene eller figurene med tabellene og figurene fra undersøkelsen om holdninger til sosial ulikhet i Norge i 1992. **Har det skjedd noen endringer fra 1992 til 2001, eller er forholdene de samme? Hvilke endringer mener du har skjedd, og hvilke forhold er de samme?**

Siste blås for utestedene

Nå skal du arbeide med datasettet Levekårsundersøkelsen 1996 – Fysisk arbeidsmiljø. Datasettet finner du i NSDstat for web. Gjør oppgavene nedenfor. Ta vare på svarene i et eget dokument som du lagrer eller skriver ut.

1. Støy, temperatur, trekk, belysning, luft og fysisk belastning påvirker det fysiske arbeidsmiljøet. Gå inn på undersøkelsen om arbeidsmiljø og se på sammenhengen mellom arbeidstakernes *UTDANNING* og opplevelsen av å være sjenert av noen av disse faktorene. Først må du tenke igjennom hvilken variabel som skal være uavhengig og hvilken som skal være avhengig (Se Metode og statistikk, Variabler). **Lag tabellene – bruk også grafikk og lag overstilte søyler**. **Finner du noen mønstre?** Åpne “Levekårsundersøkelsen 1996 – Fysisk arbeidsmiljø” i NSDstat for web
2. **Lag først tabeller der du ser på sammenhenger mellom KJØNN** (uavhengig variabel) og arbeidsmiljøfaktorene (avhengige variabler). Deretter tar du for deg sammenhenger mellom *ALDER* og arbeidsmiljøfaktorene. **Hvilke resultater finner du?**

3. Lag på samme måte en egen problemstilling og formuler en hypotese. [problemstilling] Test hypotesen – hvordan vil du forklare resultatene? Arbeid gjerne flere sammen.

Fordypning: På jakt etter arbeid

Side 3

1. Plasser de ti kommunene på kartet, og forsøk å finne ut hva som kan være grunnen til at nettopp disse kommunene har så vanskelige arbeidsmarkedsforhold.

Åpne datasettet [På jakt etter arbeid](#) i NSDstat for web

2. Bruk NSDstat for web til å lage en tilsvarende liste sortert etter stigende verdier på ledighetsvariabelen. Hvordan vil du beskrive de ti kommunene med lavest arbeidsledighet?
3. Lag en liste over arbeidsledigheten i de forskjellige kommunene i det fylket du selv bor i.

Side 5

1. Lag en skriftlig oppsummering av resultatene i tabell 3 og figur 4, og forsøk å finne forklaringer på de variasjonene du observerer.
2. Variabelen *KOMMUNETYPE-NÆRING* i datamaterialet klassifiserer kommunene i Norge i 22 grupper på grunnlag av næringsstrukturen. Studer dokumentasjonen til denne variabelen nøye, og beregn den gjennomsnittlige arbeidsledigheten i hver kommunegruppe på samme måte som vi gjorde det for de forskjellige fylkene i tabell 3. Kommenter resultatet.

Åpne datasettet [På jakt etter arbeid](#) i NSDstat for web

Tips: Bruk analysetype Deskriptiv, og oppgi variablene *TOTALT % ARB.LEDIGE 1999* som avhengig variabel og *KOMMUNETYPE-NÆRING* som uavhengig variabel.

3. Gjør det samme for de andre kommunetypologiene, som er *KOMMUNETYPE-BOSETTING*, *KOMMUNETYPE-SENTRALITET* og *KOMMUNETYPE-KOMBINERT*.
4. I alle analysene til nå har vi tatt utgangspunkt i den samlede arbeidsledigheten. I datamaterialet finnes det også to variabler som gir opplysninger om arbeidsledigheten for menn og kvinner hver for seg. Bruk disse variablene i tilsvarende analyser som vi har gjort foran. Forsøk blant annet å finne svar på følgende spørsmål:
 - Er ledigheten jevnt over større blant menn enn blant kvinner?
 - Er de regionale mønstrene de samme for den kvinnelige og den mannlige arbeidsledigheten?
 - I hvilke geografiske områder og kommunetyper utgjør kvinnene den største delen av de arbeidsledige?

5. Mange mener at de som går på ulike former for arbeidsmarkedstiltak, også bør regnes med dersom vi skal få et korrekt bilde av arbeidsledighetsproblemet. I datamaterialet finnes det tre variable som har summert sammen de som er helt arbeidsledige og de som er på tiltak. Dette er en totalvariabel, en variabel for bare kvinner og en for bare menn. Variabelen *LEDIGE OG PÅ TILTAK TOTALT* gir et mål på hvor stor andel av arbeidsstyrken som har problemer med å finne seg en plass i “det ordinære arbeidsmarkedet”. **Bruk denne variabelen** i tilsvarende analyser som vi har gjort foran. **Kommenter resultatene.**

Side 7

1. Studer den geografiske fordelingen av ungdomsarbeidsledigheten i ditt fylke, bruk for eksempel Kart og List data. Undersøk også hvordan fylket er stilt i forhold til landsgjennomsnittet. Skriv et utkast til en avisartikkel på grunnlag av de resultatene dere kommer fram til.

Åpne datasettet [På jakt etter arbeid](#) i NSDstat for web

2. Sammenlign arbeidsledigheten blant de yngste (16-24 år) og de eldste (60-66 år). Hvem er verst stilt på arbeidsmarkedet – ungdommen eller de eldre?

SØYLE: Kulturforståelse

Er vi alle like?

Bruk datasettet *World Values Survey 1995 – Kultur (utvalgte variabler)* i NSDstat for web til å svare på spørsmålene.

1. **Tror du folk er mest positive til homofili i USA, Norge eller India?** **Undersøk** hvor folk synes homofili er greit ved å trykke her.

Åpne World Values Survey 1995 – Kultur (utvalgte variabler) i NSDstat for web

NB! For å løse de neste oppgavene må du alltid bruke *NASJON* som uavhengig variabel når du lager krysstabellene. **Du kan enten lage tabeller eller søylediagram.**

2. I hvilket land er en mest skeptisk til å ha folk av annen rase i nabolaget, og i hvilket land er en minst skeptisk? **Bruk variabelen** *RASE* som avhengig variabel.
3. **I hvilket av disse sju landa tror du religion er mest viktig? Hvorfor tror du religion står sentralt i dette landet?** **Bruk variabelen** *RELIGION VIKTIG* som avhengig variabel, og sjekk om du trodde rett.
4. **Hvor tror du folk har det mest liberale synet på seksuell frihet?** **Bruk** *SEKSUELL FRIDOM* som avhengig variabel.

NB! For å løse de neste oppgavene må du bruke *TRUSRETNING* som uavhengig variabel når du lager krysstabellene. **Du kan enten lage tabeller eller søylediagram.**

5. **Hvilken religion tror du** de hører til som er mest opptatte av å prioritere menn framfor kvinner på arbeidsmarkedet dersom det er knapt med jobber? **Bruk** *MENN FYRSTERETT* som avhengig variabel og **se om du trodde rett.**
6. **Bruk** *UTDANNING AV BARN* som avhengig variabel. Se kategoriene svært enig og enig under ett. **Hvilket mønster ser du, og hvorfor tror du resultatet ble slik?**

Kulturer kolliderer

Nå skal du bruke skolevalgsundersøkelsene fra både 1999 og 2001 i NSDstat for web.

1. Gå inn i Skolevalgsundersøkelsen 2001 og **finn ut** om mønsteret fra 1999 har endret seg. **Bruk variablene** *INNVANDRINGSTRUSSEL* som avhengig variabel og *KJØNN* som uavhengig variabel.

Åpne Skolevalgsundersøkelsen 2001 i NSDstat for web

Åpne Skolevalgsundersøkelsen 1999 i NSDstat for web

2. Er det noen sammenheng mellom synet på innvandring og hvilket parti en sympatiserer med? **Finn ut** hvordan situasjonen var både i 1999 og i 2001. Er resultatene noenlunde like? **Lag en krysstabell mellom** *INNVANDRINGSTRUSSEL* som avhengig variabel og *PARTIVALG_KORT* som uavhengig variabel.
3. Kan en på bakgrunn av disse resultatene si at noen partier har velgere som er positive til innvandring, mens andre har velgere som er skeptiske til innvandring?

Mange faktorer kan være med på å avgjøre hvilke holdninger en har til innvandring og innvandrere. Fire slike faktorer kan være alder, utdanningsnivå, sosioøkonomisk status og landsdel. **Velg ut en av disse faktorene** og **grunngi hvordan du tror denne [variablen] henger sammen med** syn på innvandring og innvandrere.

Nå skal du bruke undersøkelsen *Holdninger til innvandring – utdrag fra Omnibus 1999*. De fire faktorene ovenfor finnes i dette datasettet som variablene *ALDER*, *UTDANNING*, *SOSIOØKONOMISK STATUS* og *LANDSDEL*.

1. **Test den hypotesen du formulerte ovenfor.** **Gjør tre analyser; først bruker du** *SOSIALHJELP INNVANDRERE*, deretter *ARBEID INNVANDRERE* og til slutt *KRIMINALITET INNVANDRERE* som avhengig variabel. I alle tre analysene bruker du den variabelen du selv har valgt som uavhengig variabel. **Kan du på bakgrunn av disse tre analysene si at du har funnet støtte for det du trodde?**

Åpne *Holdninger til innvandring – utdrag fra Omnibus 1999* i NSDstat for web

Rasisme – forstå, handle og forandre!

Du kan nå arbeide videre med datasettet "*Medborgerundersøkelsen 2001, Ungdomsutvalget – utvalgte variabler*".

1. I datasettet vil du se at det er stilt spørsmål om en lang rekke grupper i samfunnet. **Finn ut** hvilken gruppe ungdommene i minst grad ville like å ha til nabo?

Åpne “Medborgerundersøkelsen 2001, Ungdomsutvalget – utvalgte variabler” i NSDstat for web

2. Er det forskjeller på holdningene til jenter og gutter? **Skriv ned hva du tror før du går inn i datamaterialet for å finne svaret.** **Bruk IKKE NABO**,...som avhengig variabel og **KJØNN** som uavhengig variabel. **Ble resultatet slik du trodde?** **Hva kan forklare dette?**
3. La oss anta det å ikke ville ha islamske fundamentalister som nabo er et tegn på frykt mot det som er fremmed, kan vi da med utgangspunkt i datamaterialet si noe om hvor i landet fremmedfrykten er størst? **Igjen bør du skrive ned hva du tror før du går inn i datamaterialet.** **Bruk IKKE NABO, ISLAMSK** som avhengig variabel og **REGION** som uavhengig variabel. **Ble resultatet slik du trodde?** **Hva kan forklare dette?**

Frihetens kamprop

– et arbeidsopplegg om menneskerettigheter

Vi har nå sett at folk som bor i Norge, mener at landet vårt bør stå fremst i kampen mot land som bryter menneskerettighetene selv om dette kan skade norske eksportinteresser. Det er vel likevel slik at ikke alle er like enige i dette synspunktet. Det er vel naturlig å tro at synet på en slik aktivitet varierer med politisk og religiøs oppfatning.

Nettopp dette skal du nå prøve å finne litt ut av. Til det skal du bruke datasettet “Medborgerundersøkelsen 2001, Befolkningsutvalget – utvalgte variabler”.

1. **Formuler en hypotese (påstand om en sammenheng) som sier noe om** synet på om Norge skal være aktiv i kampen mot land som bryter menneskerettighetene sett i forhold til det politiske synet hver enkelt har. **Lag deretter en tabell som tester hypotesen.** (Tips: **Bruk variabelen PROTEST MOT MENNESKERETTIGHETSBRUDD** som avhengig variabel og **PARTIVALG** som uavhengig variabel.)

Åpne “Medborgerundersøkelsen 2001, Befolkningsutvalget – utvalgte variabler” i NSDstat for web

2. **Lag en kommentar til denne tabellen.** **Stemmer den med den hypotesen du formulerte? Blir hypotesen stadfestet, eller blir den avkreftet?**
3. Velg deg en annen uavhengig variabel, for eksempel **RELIGIØSITET**, **lag en hypotese om sammenhengen mellom** synet på menneskerettighetsbrudd og religiøsitet. **Lag deretter den nye tabellen.** **Hvordan er sammenhengen her?**
4. Studer variablene i datasettet og se om du finner andre interessante tema som kan belyses med de spørsmålene som er tilgjengelige.

Terroren traff, bombene smalt - og fremmedfrykten økte

Nå skal du arbeide i NSDstat for web med data som tar for seg holdninger til innvandrere. Start med å bruke datasettet “Omnibus mai 1999 – Holdninger til innvandrere”. **Lag toveis tabeller** der du ser hvordan de fire holdningsvariablene **OPPHOLD INNVANDRERE**, **SOSIALHJELP INNVANDRERE**, **ARBEID INNVANDRERE** og **KRIMINALITET INNVANDRERE** varierer med aktuelle bakgrunnsvariabler (uavhengige variabler). Gjør oppgavene og ta vare på svarene i et eget dokument som du lagrer og eventuelt skriver ut.

1. **Gå først videre med den uavhengige variabelen KJØNN og se hvordan den henger sammen med de tre avhengige variablene** **OPPHOLD INNVANDRERE**, **SOSIALHJELP**

INNVANDRERE og KRIMINALITET INNVANDRERE. Til sammen blir dette tre krysstabeller. Finner du noen forskjeller mellom menn og kvinner når det gjelder synet på innvandrere?

Åpne "Omnibus mai 1999 – Holdninger til innvandrere" i NSDstat for web

2. Ta så for deg de andre uavhengige variablene som for eksempel ALDER og UTDANNING, og forbered en presentasjon der du svarer på problemstillingen: Hva kan påvirke vår holdning til innvandrere?

Skolevalgsundersøkelsene har også med spørsmål som forsøker å måle holdninger til innvandrere. Det gir oss muligheter til å se nærmere på hvordan ungdommens syn på innvandrere har endret seg over tid. Den variabelen som går igjen de fleste årene, er spørsmålet om man mener innvandring utgjør en alvorlig trussel mot vår nasjonale egenart eller kultur. Bruker vi den, har vi en variabel som forteller om holdningsendringer over flere år.

3. Velg datasett fra skolevalgsundersøkelsene for årene 1989, 1993 og 2001 og ta for deg variabelen som spør om innvandring utgjør en alvorlig trussel mot vår nasjonale egenart eller kultur. Hvordan har svarene her endret seg over tid?
4. Lag en grafisk framstilling som viser endringene i disse årene ved hjelp av et regnearkprogram. I Microsoft Excel, for eksempel, lager du en grafisk framstilling slik:

Lag en tabell som denne i regnearket, enten ved å kopiere herfra og lim inn, eller skriv direkte inn. Fyll inn de prosenttallene som mangler:

	Helt enig	Nokså enig	Både og	Nokså uenig	Helt uenig
År 1989	21,7	11,8	21,3		
År 1993	21,8	12,1			
År 2001	17,2				

Marker hele tabellen i Microsoft Excel og velg **Sett inn – Diagram** fra hovedmenyen. Følg instruksjonene i diagramveiviseren. Tips: velg "linjediagram" i første trinn og serier i "kolonner" i det neste trinnet.

I Guds navn

Du skal nå arbeide videre med *Undersøkelse om religion 1998* i NSDstat for web og undersøke om religiøsitet har noe å si for hvilke verdier og holdninger mennesker har.

1. Er det de mest eller de minst religiøse som er mest enige i at religion fører til mer konflikt enn fred? Lag en krysstabell der du bruker RELIGIØSITET som uavhengig variabel og RELIGION OG KONFLIKT som avhengig variabel. Ofte kan det være lettere å se tendensene i materialet dersom du lager grafikk.
Åpne Undersøkelse om religion 1998 i NSDstat for web
2. På hvilken måte tror du at religiøsitet henger sammen med syn på kjønnsroller? Lag en krysstabell der du velger RELIGIØSITET som uavhengig variabel og KJØNNSCROLLER som avhengig variabel. Var forbindelsen slik du trodde?
3. Ovenfor kunne du lese at det råder uenighet i Den norske kirke om synet på homofilt samliv. Finn ut hva som er det dominerende synet blant religiøse mennesker i Norge ved å lage en krysstabell mellom den uavhengige variabelen RELIGIØSITET og den avhengige variabelen SEX MED SAMME KJØNN.

Du skal nå arbeide videre med “World Values Survey 1995 – Kultur” i NSDstat for web.

4. Tror du muslimer i større grad synes religion er viktig enn folk fra andre trossamfunn? Grunngi svaret ditt. Lag en krysstabell mellom TRUSRETNING som uavhengig variabel og RELIGION VIKTIG som avhengig variabel. Hvor stor del svarer svært viktig i hver trosretning?

Åpne “World Values Survey 1995 – Kultur” i NSDstat for web

Fordypning: Kultur og religion

Side 4

Figur 2 viste at det var stor forskjell på menneskene fra de fem landene med hensyn til privat religionsutøvelse, det å be. Er forskjellen den samme når det gjelder offentlig religionsutøvelse som for eksempel deltakelse på religiøse møter? Arbeid videre med problemstillingen sekularisering i datasettet Undersøkelse om religion 1998, internasjonal fil.

1. Gå gjennom variablene i datasettet og finn ut hvilke variabler som beskriver privat religiøs aktivitet og hvilke variabler som beskriver offentlig religiøs aktivitet.
2. Lag deretter krystabeller eller grafiske framstillinger der aktivitetsvariablene er avhengige variabler og variabelen LAND er uavhengig variabel. Skriv en kommentar til tabellene/figurene der du legger vekt på å beskrive forskjellene og likhetene mellom landene. Hvilke land er preget av sekularisering, og hvilke land er ikke preget av sekularisering?

Side 6

Arbeid videre med datasettet *Undersøkelse om religion 1998, internasjonal fil*, og gjennomfør de følgende oppgavene. Du bør skrive svarene i et dokument og lagre det på ditt område.

1. Formuler noen tanker om sammenhenger mellom abort og land, tenk spesielt på landene Norge, Irland, Frankrike, USA og Filippinene. Lag deretter to tabeller. I den første tabellen lar du ABORT VED MISDANNELSER være avhengig variabel og LAND uavhengig variabel. I den andre tabellen lar du ABORT DÅRLIG RÅD være avhengig variabel og LAND uavhengig variabel. Kommenter det du leser ut av tabellene. Stemmer resultatene med det du tenkte deg på forhånd?

Åpne *Undersøkelse om religion 1998, internasjonal fil* i NSDstat for web

2. Formuler noen tanker om sammenhenger mellom abort og religiøsitet. Lag deretter to tabeller. I den første tabellen lar du ABORT VED MISDANNELSER være avhengig variabel og RELIGIØS uavhengig variabel. I den andre tabellen lar du ABORT DÅRLIG RÅD være avhengig variabel og RELIGIØS uavhengig variabel. Framstill gjerne tabellene grafisk. Kommenter det du leser ut av tabellene eller figurene. Stemmer resultatene med det du tenkte deg på forhånd?
3. Er religiøse mennesker mer moralske enn andre? Formuler noen tanker om slike sammenhenger. Lag deretter krystabeller eller grafiske figurer med variablene SKATTEJUKS og OFFENTLIG STØTTE som avhengige variabler, og LAND og RELIGIØS som uavhengige variabler. Bruk kun to og to variabler av gangen slik som i oppgavene over. Kommenter det du leser ut av tabellene eller figurene. Stemmer resultatene med du tenkte deg på forhånd?

4. I hvilken grad skal religiøse ledere påvirke velgerne ved politiske valg? Dette er også spørsmål som har med moral å gjøre. Bruk variabelen *RELIGIØSE LEDERE*, *VALG* som avhengig variabel. Lag en eller flere hypoteser om sammenhenger og velg ut uavhengige variabler for å teste hypotesene. Kommenter tabellene eller de grafiske figurene. Stemmer hypotesene?

SØYLE: Det internasjonale samfunnet

Utviklingslandene i gjeldskrise

Bruk datasettet *Den globale markedsplassen* i NSDstat for web til å svare på spørsmålene.

1. Hvilke verdensdeler tror du har flest rike og fattige land? Verdensbankens inndeling av land i lavinntektsland, lavere mellominntektsland, høyere mellominntektsland og høynntektsland finner du i variabelen *VERDENSBANKENS INNDELING 2001*. Bruk Verdensbankens inndeling og funksjonen Kart. Åpne Den globale markedsplassen i NSDstat for web
2. Tre land i Europa er klassifisert som lavinntektsland. Finn ut hvilke land dette er. Hva tror du er årsakene til at disse landene er så fattige? Enten finner du landene på kartet over Europa, eller du kan bruke funksjonen List data. Velg variabelen *VERDENSBANKENS INNDELING 2001*.
3. Finn ut hvilke land som er høynntektsland i Asia. Kan du tenke deg noen årsaker til at disse landene er så rike? Du kan gjøre på samme måten som i oppgave 2.

For å svare på de to neste oppgavene, må du lete og lese på andre sider på Internett.

4. Skriv en notis der du summerer opp hva HIPC (Heavily Indebted Poor Countries) er. Den informasjonen du trenger, finner du ved å ta utgangspunkt i nettstedet til Verdensbanken. Sidene er på engelsk.
5. Velg deg et land med store gjeldsproblemer fra nettstedet til Verdensbanken. Skriv en rapport om dette landet. Finn for eksempel ut hvor det ligger, hvilken type styresett det har, hva som er de viktigste eksportproduktene og hvor mange innbyggere det har. Nettstedet *The World Factbook* er et godt utgangspunkt for å finne slik informasjon, men du må merke deg at også disse sidene er på engelsk.

Verdensbanken HIPC – (engelsk)

Verdensbanken Country Cases – (engelsk)

The World Factbook – (engelsk)

Folkets demokratiske diktatur

Bruk datasettet *World Values Survey 1995 – Demokrati* (utvalde variabler) i NSDstat for web for å finne svarene på spørsmålene.

NB! For å løse disse oppgavene, må du alltid bruke *NASJON* som uavhengig variabel når du lager krysstabeller.

1. Lag først en krysstabell med *DEMOKRATI* som avhengig variabel. Noter deg prosentdelen som svarer svært bra i de forskjellige landene. Deretter lager du en krysstabell med

DEMOKRATI BEST som avhengig variabel. Noter deg prosentdelen som svarer svært samtd i de forskjellige landene.

Åpne World Values Survey 1995 – Demokrati (utvalde variabler) i NSDstat for web

2. I hvilket av disse landene er en mest positiv til et demokratisk styresett? Skiller de tidligere kommunistlandene Polen, Øst-Tyskland og Bulgaria seg ut?
3. **Tror du det er en vanlig oppfatning i Norge** at en kan bruke vold for å nå politiske mål? **Lag en krysstabel med BRUK AV VALD** som avhengig variabel, og **finn ut om du trodde rett.**

Du finner tre variabler som inneholder informasjon om hvordan de spurte vurderer det tidligere, det nåværende og det framtidige politiske systemet. **Lag tre krysstabeller** der du bruker *POLITISK SYSTEM FØR*, *POLITISK SYSTEM I DAG* og *POLITISK SYSTEM OM TI ÅR* som avhengige variabler. Noter deg hvor stor prosentdel som har svart *dårleg* i hvert land for hver av de tre analysene.

4. I hvilke land er en mest misfornøyd med tidligere, nåværende og fremtidig politisk system?
5. **Hvordan vil du tolke disse resultatene?**

Med frykt i bagasjen

Du skal nå bruke NSDstat for web til å arbeide videre med flyktningsspørsmål.

1. Tabell 1 i teksten over viste hva skoleelever mente om å ta i mot flyktninger. Med variabelen *MOTTA FLYKTNINGER* i undersøkelsen *Nasjonal meningsmåling skolevalg 2001*, **kan du lage en tilsvarende tabell** for et representativt utvalg av hele folket. **Har folk flest svart annerledes enn skoleelevene?**
Åpne Nasjonal meningsmåling skolevalg 2001 i NSDstat for web
2. **Lag en tilsvarende tabell som den du laget i oppgave 1** med variabelen *MOTTA FLYKTNINGER* i *Nasjonal meningsmåling skolevalg 1997*. **Hvordan har frekvensfordelingen endret seg fra 1997 til 2001.**
Åpne Nasjonal meningsmåling skolevalg 1997 i NSDstat for web
3. **Lag en krysstabel der du bruker** *MOTTA FLYKTNINGER* som avhengig variabel og *LANDSDEL* som uavhengig variabel. **Hvordan vil du tolke dette resultatet?**
Åpne Nasjonal meningsmåling skolevalg 2001 i NSDstat for web
4. Nå skal du arbeide med datasettet *Krig og fred*. I hvilken verdensdel tror du at flest mennesker blir drevet på flukt? **Lag en deskriptiv analyse der du bruker** *FLYKTNINGER*, *HJEMLAND 1997* som avhengig variabel og *VERDENSDEL* som uavhengig variabel. **Sammenlign tallene i kolonnen Sum.** Hvorfor tror du at denne verdensdelen har et stort flyktningproblem?

Åpne Krig og fred i NSDstat for web

5. Bruk datasettet *Krig og fred* og *List data* for den verdensdelen som har flest flyktninger. Hvilke land merker seg ut ved å ha flest og færrest flyktninger i denne verdensdelen? Kan du finne en forklaring på hvorfor problemet er så stort i det landet med flest flyktninger?

Kampen for naturen

Du skal nå arbeide videre med datasettet *Den globale søppelkassen* i NSDstat for web.

1. Lag et tilsvarende kart som i figur 1, men denne gangen skal du bruke variabelen *FORURENSINGSANDEL 1996*. Denne variabelen måler hvor mye karbondioksid hvert land

slipper ut i forhold til det totale utslippet av karbondioksid i verden. Slipper Norge fremdeles ut mer karbondioksid enn Spania og Frankrike? Er det noen enkel forklaring på dette?

Åpne Den globale søppelkassen i NSDstat for web

2. Hvilket land i Europa tror du har størst energiforbruk per innbygger. Grunngi svaret ditt. *List data* for Europa på variabelen *ENERGIFORBRUK 1996*. Sorter lista stigende. Har du noen forklaring på dette resultatet?
3. **Lag en deskriptiv analyse der du bruker** *ENERGIFORBRUK 1996* som avhengig variabel og *VERDENSBANKINNDELING 2001* som uavhengig variabel. **Hvordan vil du tolke resultatet?**
4. Det er bred enighet om at en må arbeide for å øke levestandarden i de fattige landa. Mange mennesker drømmer først og fremst om å få legge seg mette og utørste. Synes du at alle mennesker på jorda bør ha det like godt som vi har det i Norge? Hvilken virkning tror du økt levestandard i de fattige landa har for miljøet? **Lag en deskriptiv analyse der du bruker** *FORURENSING 1996* som avhengig variabel og *VERDENSBANKINNDELING 2001* som uavhengig variabel. **Sammenlign summene** og **drøft om det er bra for miljøet at levestandarden øker**. Kan det tenkes at levestandarden i høyinntektsland er for høy?

FN og Norge – en kjærlighetshistorie?

Du skal nå arbeide videre med datasettet *World Values Survey 1995 – Tillit* i NSDstat for web.

1. **I hvilket av de følgende land tror du at tilliten til FN er størst: i USA, Mexico, Australia, Norge, Nigeria, India eller Russland.** Grunngi hvorfor du tror tilliten er spesielt stor i dette landet. Det heter å lage en hypotese eller en antakelse om en sammenheng. **Kontroller hypotesen ved å lage en krysstabell** med *FN* som avhengig variabel og *LAND* som uavhengig variabel.

Åpne “World Values Survey 1995 – Tillit” i NSDstat for web

2. **Lag en krysstabell der du bruker** *PARLAMENT* som avhengig variabel og *LAND* som uavhengig variabel. **Sammenlign denne tabellen med den du laget i oppgave 1.** Kan vi si at FN har stor tillit blant folk i de ulike landene når vi sammenligner med den tilliten de har til det nasjonale parlamentet? I hvilke land har folk større tillit til FN enn til det nasjonale parlamentet?
3. **I hvilket av disse landene tror du** politiet har størst tillit? **Lag en krysstabell med** *POLITIET* som avhengig variabel og *LAND* som uavhengig variabel. **Ser du noe mønster?**
4. Hvilket syn har folk i hvert av disse landene på pressen? **Finn ut av dette ved å lage en krysstabell** med *PRESSA* som avhengig variabel og *LAND* som uavhengig variabel. **Hvordan vil du forklare dette resultatet?**
5. Hvorfor er det viktig at folk i verden har stor tillit til FN?

Europa - det nye eurolandet

Side 3

Det er stor forskjell på de europeiske landene når det gjelder økonomisk og sosial status og utvikling. Bruk datasettet *Den globale markedsplassen* for å si noe om hvilke forskjeller det er på disse områdene mellom medlemslandene i EU, EFTA/EØS-landene og søkerlandene i 2002. Opprett et tekstdokument for å lagre svarene på oppgavene nedenfor.

1. Bruk variablene *ARB.STYRKE TJENESTE 1990*, *INNTEKT (PPP-DOLLAR) 1997*, *ØKONOMISK UTVIKLING 1975-1997*, *EKSPORTANDEL 1997*, *INFLASJON 1990-99* og *DRIFTSREGNSKAP 1999* som avhengige variabler og *EU-STATUS FORENKLET* som uavhengig variabel. **Bruk analysetypen deskriptiv og lag en tabell for hver avhengig variabel.**
Kommenter de forskjellene du finner.

Åpne *Den globale markedsplassen* i NSDstat for web

2. Lag deretter et kart over Europa for hver av de avhengige variablene. Kopier kartene og lim dem inn i tekstdokumentet. Tips: Kopier med tasten Print Scrn på tastaturet. Hva forteller disse kartene om økonomisk utvikling i Europa?

Side 6

Spørsmålet om ja eller nei til norsk medlemskap i EU har vært stilt flere ganger i spørreundersøkelser de siste førti årene. Selv om motstanden har vært jevn og stabil i hele perioden, er det likevel slik at holdningen til EU har variert med hensyn til alder, partitilknytning og hvor en bor.

I europaundersøkelsen som NSD gjennomførte i januar 2001, fikk et representativt utvalg av folk i Norge spørsmål om sitt syn på norsk medlemskap i EU. Tabell 2 viser at 44,6 prosent av de spurte som hadde noen mening, ville stemme for norsk medlemskap, mens 55,4 prosent ville stemme mot.

Tabell 2: Ville du stemt for eller mot norsk medlemskap i EU nå?

VILLE STEMTE EU NÅ: Ville du stemt for eller mot norsk medlemskap i EU nå?

	Kode	Frekvens	% av gyldige
Ville stemt for	1	372	44,6
Ville stemt mot	2	463	55,4
Vet ikke	8	183	
Mangler data	9	3	
Total :		1021	100,0

Åpne i NSDstat for web

Men hvordan er holdningen til EU hos folk når vi tar hensyn til bakgrunnsvariabler som alder, partipreferanse og geografi? Bruk datasettet *NSDs europaundersøkelse 2001* og gjør oppgavene nedenfor.

1. Bruk variabelen *VILLE STEMTE EU NÅ* som avhengig variabel og *ALDER* som uavhengig variabel. **Lag en tabell eller figur** og **kommenter forskjellene i holdning til EU mellom aldersgruppene.**
Åpne *NSDs europaundersøkelse 2001* i NSDstat for web
2. **Lag deretter to nye tabeller eller figurer med variabelen *VILLE STEMTE EU NÅ*** som avhengig variabel og variablene *PARTIPREFERANSE* og *REGION* som uavhengige variabler. **Kommenter tabellene eller figurene.**
3. I hvor stor grad har de som stemte i folkeavstemningen i 1994, endret syn på spørsmålet om medlemskap? **Lag en tabell eller figur med variabelen *VILLE STEMTE EU NÅ*** som avhengig variabel og *STEMTE EU 1994* som uavhengig variabel. **Kommenter tabellen eller figuren.**

4. Bruk variabelen *MEDLEM INNEN 10 ÅR* som avhengig variabel og *ALDER* som uavhengig variabel. **Lag en tabell eller figur** og **kommenter forskjellene i holdning til EU** mellom aldersgruppene.
5. **Lag deretter to nye tabeller eller figurer med variabelen *MEDLEM INNEN 10 ÅR*** som avhengig variabel og variablene *PARTIPREFERANSE* og *REGION* som uavhengige variabler. **Kommenter tabellene eller figurene.**

Fordypning: En delt verden

Side 4

Hent inn datasettet “Utvikling med et menneskelig ansikt” i NSDstat for web, og gjør deg kjent med variablene. Utdypende forklaringer av variablene får du ved å velge en variabel og trykke på knappen Dokumentasjon.

Lag alle de karta og tabellene som er presentert til nå i dette kapitlet. Lag deretter tilsvarende kart for de andre delene av verden. Summer opp de regionale HDI-mønstrene for hver verdensdel i noen få setninger slik det er gjort for Afrika ovenfor.

Bruk List data til å se hvilke ti land som kommer best ut på HDI-indeksen.

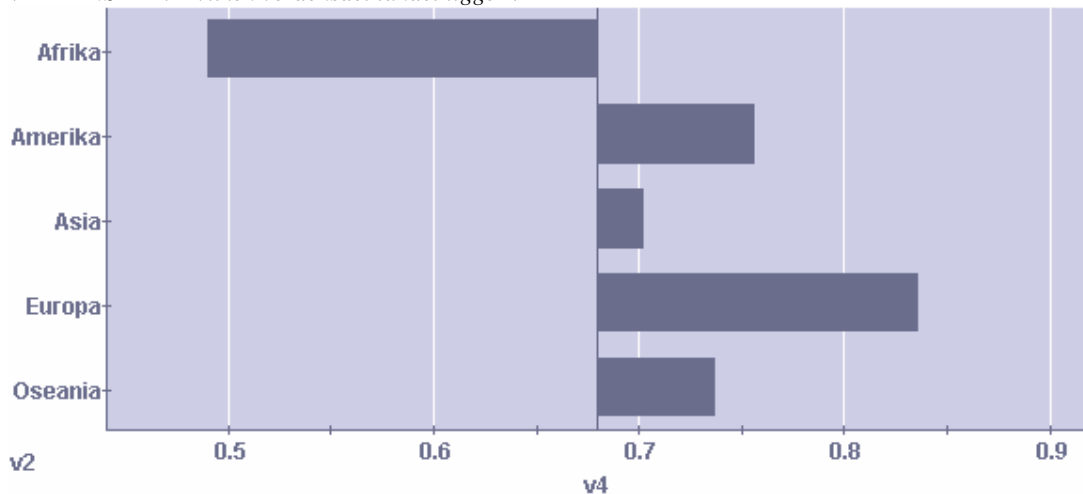
Studer hvilke ti land som kommer best og dårligst ut på målene til Verdensbanken (bruk variabelen *INNTEKT*) og til UNICEF (bruk variabelen *BARNEDØDELIGHET*). Sammenlign resultatene med hverandre og med dem fra HDI-indeksen.

Figuren under viser hvordan den gjennomsnittlige HDI-skåren i de forskjellige verdensdelene skiller seg fra den gjennomsnittlige HDI-skåren for hele verden. Bruk NSDstat for Web til å skape denne figuren.

Figur 4: HDI-skåren 1997

HDI-SKÅRE: Landets verdi på Human Development-indeksen, 1997

VERDENSDDEL: Hvilken verdensdel landet ligger i



Åpne i NSDstat for web

Forklaring til figur 4: Søylediagrammet viser hvordan den gjennomsnittlige HDI-skåren i de forskjellige verdensdelene skiller seg fra den gjennomsnittlige HDI-skåren for hele verden. Afrika kommer dårligst ut, deretter kommer Asia, Oseania og Amerika. Høyest gjennomsnittlig verdi på HDI-skåren har Europa.

Bruk den samme metoden til å studere hvordan verdensdelene kommer ut på målene til Verdensbanken (*INNTEKT*) og UNICEF (*BARNEDØDELIGHET*). Er rangeringen mellom verdensdelene den samme, eller finner dere viktige forskjeller?