

Running head: WHAT'S IN A SOFTWARE?

What's in software? Making use of project support in writing at senior high school.

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The writing of this paper was made possible by funding from the Swedish Knowledge Foundation (KK-stiftelsen) through its research program LearnIT, and from the Swedish Research Council, Committee for Educational Science. The article is written as a part of the projects ICT and Learning in Teacher Training, and Cribbed notes: How youth and young adults regard school performance and conventional norms.

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Abstract

Title: What's in software? Making use of project support in writing at senior high school.

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Paper presented at the 34th congress of the Nordic Educational Research Association (NERA) in Örebro, Sweden, 9th to 11th of March

Student learning is often constituted as an effect of new technology for finding and retrieving information, for editing in word processors and for presentation as texts or reports. This is one way we learn to see student use of technology in academic and educational discourse. In this exploratory study we investigate how senior high school students learn to see information management. This study uses videotapes, recordings of screen activities in Encarta Researcher, an application designed to support project work, and teacher instructions as data to investigate the discursive practices used in a senior high school environment to make sense of collecting and using information. In line with Goodwin (1994) "seeing is investigated as a socially situated, historically constituted body of practices through which the objects of knowledge which animate the discourse" are constructed and shaped. It focuses on how students turn artefacts, like theories, instructions, software and available information into objects of knowledge that constitute a domain for learning. Using our exploratory data we discuss how students constitute a particular type of software and needs for future research into how students learn to see technology in the domain of writing.

Key words: professional vision, student vision, technology, report generators

It was a ninth grade student who first alerted us to one paradoxical effect of contemporary discourses on cheating. She was asked to work on her English on an essay she was about to hand in. She said “No.” Asked why not she answered: “This is good enough for an A. If I do it better they’ll just suspect that I’ve cheated and downloaded the essay from the Internet.”

The comments from the student should be contrasted to the high expectations on learning with technology often present in policy documents. Educational policies in Sweden as well as many other countries emphasize the importance of technology in education and during the last decades networked computers and their applications have become a generic element in education. There is a general consensus that the use of technology is important for school development. Consequently schools must venture to use a new infrastructure in order to improve education and provide better learning opportunities for their students. In discourse about students, these are often positioned as students of an information or knowledge society, one implication being that they must master new ways of learning using new technology. While it was enough for earlier generations of students to master books and library catalogues, it is considered that students in an information and knowledge society must be able to use technology to search electronic databases for information, to forge global contacts, to enter virtual learning communities, to maintain web-pages, to prepare presentations, to program robots that they have built and so forth.

Policy texts that mention information and communication technology generally present these expectations positively. In research on cheating (and plagiarism) it is usually the other way around. Cheating is either glossed as a direct result of technology or at least as motivated by technology design. There is a fear that radio transmitters, Simple Message Service, USB-memories and alike are used as modern cheating aids because they can be used that way. The epitome of technology induced cheating in this day and age in that line of thought appears to

be copy-and-paste plagiarism. There is a fear that students use technology to support buying and downloading essays from term paper mills; that they copy and paste material from Internet sources without proper attribution; that students perceive of the Internet as a source that is free to use, and so forth. Consequently the proliferation of technology oriented threats to the integrity of academic writing gains interest especially in the context of assessment.

In research on cheating it seems fair to say that the expectations are that technology boasts unethical behaviour. To give but one example that concerns Internet technology Auer and Krupar (2001) claim that the “proliferation of paper mills, full-text databases, and World Wide Web pages has made plagiarism a rapidly growing problem in academia.” Since these applications can support easier access to information they are assumed to be behind a rapidly growing problem. There are also suggestions of the opposite. Roach (paraphrased in Simon et al., 2003) suggests that if instructors take care to “adjust their classes to the presence and use of new technologies, there is very little to fear in terms of the proliferation of plagiarism” (p. 201). Roach statement suggest that he considers technology use to be a problem of instruction.

The empirical foundation for these assertions can in most studies be described as anecdotal. They are inserted as the beliefs of the author, sometimes as the beliefs of another attributed author but seldom pointing to an actual study. Occasionally they draw on students' claims from surveys that suggest that plagiarising may be on the rise because Internet makes plagiarising easy or ratios of students that admit to have used technology in this way. In the rare case they draw on studies of student use of technology. It is contended here that little has been done to study the problems students have to confront when they use the Internet and other artefacts to support information seeking/searching and essay writing. Were they actually trying to take a short cut when they only changed some words in the copied source, when they

did not use quotation marks, did not include the electronic reference, or were they doing something else? This is an area of research this study aims to contribute to.

Information and communication technology is often glossed in a way that relates technology to cheating and plagiarism. This relation has become of immediate interest for study. It has been argued that computers and information and communication technology were not designed to be used in education (Cuban, 1986; Säljö, 2002). Still great expectations and great worries have been tied to the use of technology in education. To be useful in education this technology has to be adapted to the needs of students and teachers and integrated in their practices. As a consequence teachers and students become involved in processes of interpretation. Whether or not it is okay to download texts and marginally change them with the help of computer editing turns into a dilemma students need to deal with. The present paper takes an interest in dilemmas of this kind. The empirical focus is the meaning-making of students that use technologies for information retrieval, data processing and writing. Students in this study have been confronted with software that can be used to prepare patch works as well as professionally deigned reports. What do they make of such software? What features do they take an interest in? How do they consider that they should be used? What do students make of these technologies and how can we relate their use to practices of learning?

Learning with project software

From the perspective of this paper what people learn from the use of technology is always to some part contingent. This is also what is suggested by the first introductory paragraph. The ninth grade student has learned that she can not work to her full potential if she wants to avoid accusations of cheating. She makes relevant that a technology such as the Internet makes teachers suspicious. Despite the endless possibilities that are afforded to her by

design such as using the Internet to find formulations or the word processor to check grammar, she prefers not to use them fully. A point of departure for the study is that design does not tell us how artefacts get used. What keeps the ninth grader in the story from searching for information or using a grammar checker it is not that technology does not make it possible or that she does not know how to. She has been embedded in a culture where Internet use is met with suspicion and learnt that it does not pay off to put technology to full use. The way she perceives technologies' affordances is by large a result of action

Technology in the learning environments where data for this study have been gathered affords searching for information. How this possibility and other possibilities are used by students we know little about. We know that searches can be extended to the whole Internet or be restricted to certain data bases; they may be supported by an endless array of specialized tools or restricted to a local search form depending on how the system is configured. Yet design does not fully inform on use. Design is interpreted in situ. Some students learn enough to bypass instructions. They may consider restrictions imposed on them as unsupportive and as obstacles preventing them from getting the best of technology. Other students follow guidelines. They may argue that a simple search form and access to a local encyclopaedia provide enough support for them to be able to do their work. Some students learn to appreciate the possibility to reach all sorts of information. They may see freely available information as a resource. They learn to treat that information with suspicion and value it using different methods for critical analyses. Other students learn that the amount of information available on the Internet is confusing. When confronted with such unstructured information they avoid ambiguity and search for answers.

Artefacts, physical as well as intellectual have always played an important part in learning (Säljö , 2005). It is hard to imagine education without pencils and books. It is probably easier to see how these artefacts have contributed to learning in our educational

institutions. Course books give students new possibilities to bring the subject content with them when they leave class. Pens and papers open a possibility for students to follow a lecture and take notes. Learning in that sense can be thought of as contingent on the artefacts a certain society has at its disposal. In some cases the students chose not to bring their books home or rely on memory instead of take notes. In research on cheating this type of contingency is by large ignored. Instead focus is placed on certain type of cheating for example plagiarizing or fabricating results. A link is established between these results and how technology can contribute to these results. Human interaction with technology is not brought into the equation. The interest in how students arrive at the decision to use technology to produce a certain type of text for example has been minimal. Most of the arguments that connect plagiarism and technology have, for example, ease and speed in common (cf. Ashworth & Bannister, 1997; Auer & Krupar, 2001; Austin & Brown, 1999; Evans, 2000; Logue, 2004; Miall, 2005; Underwood & Szabo, 2003; Walker, 1998). It is easier to find and download information. It is faster to copy and paste from databases than to copy by hand. Plagiarising that was once a laborious practice that could secure the livelihood for the ancient copyists and their writers (Meidinger, 1840) and the monks who copied ancient books to build up large libraries has become too easy; easy enough to corrupt students.

Ashworth and Bannister (1997) claim that the way students perceive of their acts is neglected in research on cheating. In the perspective guiding this study acting is perceiving. To act in a certain way means to see something in a certain way. In this study we aim to scrutinize student learning in a context where they can use software designed to gather, structure and edit information, and to generate reports. The use of the software is not mandatory. The students collaborate in order to find and use information to solve problems in the context of what can loosely be defined as problem based learning and the use of the software is an option that has been introduced to them by us. Drawing on Goodwin's (1994)

concept professional vision we investigate students' vision as a pragmatic problem. In particular our aim is to investigate how student actions are situated as systems of meaning that visualize affordances of technology. Our approach is exploratory in the sense that we have a broad interest in what goes on rather than a well delimited study object. Using data from video recordings we illustrate what students construct as affordances as they interact in front of the computer. Finally we discuss a possible field of tensions between how students and professionals turn artefacts into objects of knowledge, and political expectations about how these artefacts will improve the ability to deal with information.

Professional vision and student vision

Tensions between possible ways of using artifacts and the different kinds of seeing that a student and a professional teacher engage in when they use different artifacts are the topics of this paper. People learn to see in different perspectives, to see different aspects of phenomena as well as of situations in which these phenomena occur. Seeing is revealed in action. Goodwin (Goodwin, 1994) uses the metaphor professional vision in investigations into the “socially situated, historically constituted body of practices through which the objects of knowledge which animate the discourse of a profession are constructed and shaped” (p. 606). Seeing is treated by Goodwin as a part of professional vision, a part of how professionals go about building and contesting the elements of their life world. He asserts that professionals see within mutually shared frameworks using particular methods that guide their vision. They use particular coding schemes to transform objects into objects of knowledge for their profession. They make specific phenomena salient by highlighting them through marking them in a fashion particular to the profession. They also produce and articulate representations in a particular way. He asserts that seeing certain structures in a layer of dirt is not an individual accomplishment but afforded by activities in archaeology (Goodwin, 2003). Seeing these structures in this particular way is a property of a particular professional vision and a

property of dirt situated in activities where these properties are made relevant. Further Goodwin claims that “rather than simply providing definitions of categories, the process of using such talk and gesture to actually work with the dirt being excavated helps organize the ensemble of embodied practices required.”(p. 3).

Conceptualizing this type of seeing primarily as professional seems to us to put a limit to its usefulness. A socially constructed seeing of the same kind as professional vision ought to be equally important in any occupation or other context of communication. Possibly students see certain structures in information seeking/searching and essay writing in the way tools can help them organize their required practices. Student vision defined as the process of using particular forms of talk and gestures for doing student work should in this sense play an important role for organizing the ensembles of practices required for them to carry out their work, such as, for instance, using a particular technology or particular software.

The context

The present study should be seen as a first effort to venture into students' ways of acting with a particular kind of software presented by the software vendor as a software that

helps students collect and organize text and pictures as resources from Encarta and the Web, so they can construct exceptional reports and projects in less time. Encarta automatically creates relevant footnotes and bibliographies, then includes them in the finished reports. (Microsoft web page)

Students that use this software may or may not discover the possibilities to collect and organize or have other ideas about what makes an exceptional report. Data collection was conducted in a Swedish senior high school. The students in this study had entered the last grade of senior high school. The class consisted of 30 students. Observations were made during scheduled periods for what was termed problem based learning. In these sessions

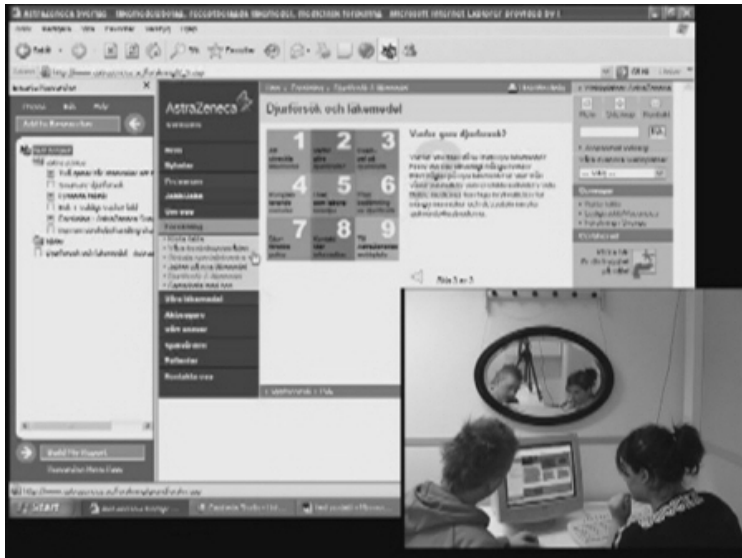


Image 1: The video setting

students at this particular school typically work on themes involving several disciplines. They are left with an overarching problem that they need to define, formulate a purpose for their study of, and break it down into questions to generate knowledge about, find information about,

synthesize and present. The students work in groups of 4-6 students who collaborate to solve the problem. Formulating purpose and initial problems is usually work performed in whole group sessions whereas information gathering and synthesis on different problem areas are conducted by one or two students. Finally the team gathers and puts their work together.

The material presented here are from sessions where the students work with computers using a plug-in called Researcher. Data have been collected from sub groups working by the computer on partial problem areas. In one of the sessions (JF), project-files have been kept together with a text generated by the Researcher.

The software

A special kind of software, supporting the collection and structuring of information, was used by the students. The software works as a plug-in to the browser. A special button that activates the application appears on the tool-bar of the browser. In the left corner of the browser window an additional frame appears where students can structure information they find on different web sites either by clicking or by drag-and-drop. The software makes it possible to sort and structure information during the collection phase. It also makes it possible to edit the collected information directly or to make notes in the structure. These notes can be

more general reflections or references to other sources than electronic, or inclusions of quotes from books or interviews. The software also keeps track of the source from where the information is collected. When the students have “enough” information they can let the software build a “raw report” containing all information collected, nested with notes, comments and questions made by the student. At the end of the “raw report” the software will



Image 2: The program view

add a correct reference list of all the sources used during the collection phase. This “raw report” can be exported to several different formats, like HTML or as a Word document.

Method

There are a number of studies these last years reporting different methods for gathering and presenting video-data. In this paper we primarily make use of recorded speech. Data

however was generated in a project where video was used to capture students’ talk and bodily movements. Behind the computer was placed a mirror allowing capture of movements and facial expression when filming at an angle from behind. Furthermore screen capture software was used to capture all movements on the screen making it possible to follow cursor movements, menu-activities and changes in content. Unfortunately the screen capture for this particular set of data was destroyed leaving only the video recording. Since there were sequences of particular interest to our research we still venture to use them. The screen captures would have added information about the sites that were visited and the particular

texts that were talked about as well as what features of the software that were activated. What would be possible to say without the support of screen captures?

The taped session used has been feed into Transana. In Transana videos can be transcribed while they are played on the screen. The software supports Jeffersonian transcription. In this study speech has been transcribed as natural talk, but only the possibility to measure pauses has been used in the excerpts. Transana also supports category building. Time codes can be inserted to segment talk and keywords can be inserted to mark up portions of talk, making it possible to search for items of particular interest. In this study the approach has been more explorative and guided primarily by the participating students' own acts and use of categories.

Findings

M and K struggles with a part of a group assignment. The theme concerns industrialisation and it is studied as a cross disciplinary project. The method used is conceptualized as Problem Based Learning. The aim set by the teachers is to learn about development and characteristics of industrial society. This aim is transformed into areas of interest. Interests have been transformed into guiding questions by the project group "Legolas" to which M and F belong. In the sequence where data has been lifted M and F try to come to terms with the question what effects of the industrial revolution that can be seen in Sweden today.

In turns that come before our excerpts M talks about the meaning of the word "purport" several times, finally impatiently knocking at the table. As it appears it is not just "purport" that he needs make sense of. M tries to find relevant concepts that relate to "purport" that fit and can be used as search variables. He finds texts about workers and poor people but nothing fits directly with purport. He tries words like urbanisation and union but retracts the words as if making a repair. M's search for the meaning of purport is clearly intimately tied to a need to

find words that can be combined in searches that yield the right hits. Whereas M is dissatisfied with their sources and keeps searching for a good source, K seems less disturbed. Early in the conversation he makes a pragmatic definition of “purport”. It may be hearable as a suggestion to get the job done, but it includes taking the best sources you have found reading what you have and constructing a background.

What makes M reject sources that K accepts? K suggests a particular source that he can use. M objects that “the question is whether this is not just” which is hearable as it is just about Great Britain not about Sweden. K retorts that “that’s where it originated from”. It seems obvious to both of them what the reason for rejection and acceptance is. At this point however, it might as well concern the reliability of the source. M’s objection becomes clear six turns later. The text is about Great Britain and not Sweden and the issue is whether the purport on Great Britain is a Great Britain purport rather than a general purport. All from the beginning K sees this as a lesser problem. Later they return to the problem that most of the texts they find are about Great Britain. At this point however K argues that texts about Great Britain may work well when you make a sketch of the background of industrialisation. The kind of student vision displayed up to the point where we enter our data is one that sees unstructured information as a dilemma. How can students find information? How can they be sure that the information they find gives them support in their work with their assignment?

On several occasions M and K turns towards the software and comments or points to affordances that they relate to the assignment. They show concern for what type of sources they can access through the Researcher and how to search using this plug-in. What appears to be most problematic is the limited access to sources speaking of industrialisation in Sweden; a problem that is not directly related to the use of particular software for searching. Dealing with these problems focus suddenly turns to the “building of reports”. In the following lines

we can see some interesting things that relate to the problem of importing other texts into your projects:

MK1:

105. K: ...the danger with an application of this kind can't it be that you enter and
106. M: copies
107. K: no but that you enter here and then it says here where it's from [points to references]
108. M: yes
109. K: and then you write something here [points to a place in the text]
110. M: yes
111. K: in the middle
112. M: yes but then
113. K: of the text
114. M: but then suddenly it's not because
115. K: yes exactly
116. M: but you're not supposed to rip it straight off this is just kind of kind of a summary not a summary it's like citing a source
117. K: yes okay yes
118. M: so then
119. K: then you write
120. M: it is
121. K: more
122. M: it is like from here
123. K: yes (3,6)

K starts asking about what he presents as a danger with the software and is supplemented by M who inserts “copies” into his sentence [Line 106]. Copying is one of the most obvious features of the software. You collect texts and add them to the project. In other words you copy them. This however is not the danger K refers to. If they collect a text and then edit it, their amendment will be part of the original source and may be referenced as a direct quotation. K seems to suggest that this problem is brought about by a feature in the plug-in. Researcher makes it possible to collect and edit in the same phase. What prevents the user from inserting text in such a way that it appears to be a part of the cited text. There is nothing that indicates that he is unclear about the rules for citing. Instead he seems to prod for an answer to how one should treat the references [Lines 107–115] when the text is altered. It also says something about his perception of writing. K seems to indicate that that there should be a

way to distinguish between the sources and the students' voices in the editing face so these voices are not confused when a report is generated. This is hearable as claim that the material they take from the web and their own texts should strictly follow the rules for citation.

This is not how M makes sense of this feature. In Line 116 he presents the plug-in differently. To him it is merely a way of collecting information, keeping track of the references and adding comments. Texts should not be ripped off from the net. Collected texts are not texts that should be submitted as their assignment. Neither are comments considered to be texts inserted into texts of other authors. He has obvious problems in deciding what the new text stored in the Researcher represents. It is a summary he suggests. No it is not a summary it is a list of references. Possibly this means that he regard them as nothing more than a collection with correct attributions attached to them. This is a line of reasoning that K seems to accept [Lines 117–123]. M and K's discussion points to one of the problems brought up by Pecorari (2003). Students as high up as at a doctoral level often treat texts they have amended as summaries rather than as citations surrounded by paraphrases. Student vision is displayed through the students' attempts to reconcile their understanding of authorial voice, attribution and the possibilities to highlight these connections through the affordances of the software. M and K seem to be well aware of this problem; whether through earlier work or work with the plug-in can not be asserted. Suggesting that the result is a list of references does not solve the problem per se. It is true that the software generates a list of references covering all imported texts. It does however also preserve all imported texts with any insertions. It can be argued that it is an understanding allowing the students to go on with their work aware that their voice must be kept separate from the voice of other authors when they compile their report.

In our last example, from the end of the film session, M and K returns to affordances they perceive using the Researcher. Discussing what sources to use and rejecting a large number they have finally generated a report. They are bewildered when they see that it consists of 15 pages. Once again K evokes what is considered here to be a kind of school frame and returns to the possibility to use the software to plagiarise:

MK2:

231. A: yes I don't understand why it behaves like this

232. M: now I think it's this very many pages why doesn't it say how many

233. A: it will appear

234. M: 15

235. A: 15 pages

236. M: takes time to read

237. K: can hand in later doesn't look suspicious at all [with an ironic tone of voice]

238. [Everyone laughs]

239. M: yeah the only thing that was a bit annoying was with that home page we visited the one the one where you couldn't ctrl paste them ehm copy the whole pages and ctrl yourself past some

240. A: no

241. M: I had to copy from each one

242. A: okay then you just remove it later okay

243. M: yesyes

244. A: but what does your report look like now and do you have everything

In Line 236 M comments on the state of this report. It is far from the “exceptional” report promised by the software vendor. It is more like the list of references suggested by M in the earlier section. He comments that it will take time to read. In Line 237 K remarks that they could deliver this report as their own. The ironic tone of voice and the laughs suggest a shared understanding not only that such an act would be fatal. The comment does not warrant an explanation. Student vision is displayed through their interpretation of what the generation of an unedited report would amount to. It is indexical to them that compiled texts are not allowed and the wording that it “doesn't look suspicious at all” signals that handing in such a text is an act their teachers would easily spot as cheating. A possible affordance using the program to cheat is not taken seriously. It is glossed as a ludicrous possibility. Concerns are directed

towards report generation. There is a lot of text. M expresses concern that it was not easy to collect text effectively. In Line 239 M uses the term c-t-r-l, a typical example of an indexical way of describing keyboard short cuts. He makes relevant that it was not possible to decide exactly what portions of information to include so too much has been included. A, one of the authors, shows surprise but informs that these texts can be removed later.

Discussion

Students have been followed as they work on a project assignment using the Researcher plug-in. Two excerpts from one sequence has been used as an illustration. The aim of the study was to investigate how student actions were situated as systems of meaning that visualizes affordances of technology. Following Goodwin (1994) we assumed that students would see technology through “a socially situated and historically constituted body of practices” here represented by a writing-assignment and that technology would be turned into an object of knowledge that animated their discourse. We were particularly interested in what features of technology that would be highlighted and how these features would be coded given present discourses on technology and cheating.

Today it is possible to use specific software to search for, find and retrieve various types of information, keep track of references, and summarize and compile texts to produce passable reports. It has earlier been shown (Nilsson, Eklöf, & Ottosson, 2004) that there are discourses about students' information seeking, information management and writing where technology is treated both as a threat to the quality of their work and as a means to achieve better quality. The threats range from blatant deceit where students download texts from the Internet (Austin & Brown, 1999) and pass them off as their own over different forms of plagiarism where copy-and-paste techniques influence the process of completing the assignment (Nilsson, 2005), to patch-work writing (Howard, 1995, 2000) and attempts to transform rather than work with the content of texts (Alexandersson & Limberg, 2004).

Contrary to what is said about the effects of use of technology in much research on cheating plagiarism does not surface as a viable option. The excerpts illustrate some problems students highlight and how they code them. The choice of information to work with appear as a dilemma to the students. Working with the Researcher the students highlight how imported texts can be mixed and how it may become impossible for them to separate different authorial voices. As they talk about how they can use the software it is revealed that the separation of authorial voices is coded in a particular way. Using the plug-in to compile texts is not treated first of all as a fast and easy fix for producing a report, but as a problem of managing quotes and references correctly. In that their way of using technology to animate their discourse points in a different direction than many studies on cheating and plagiarism. Technology is a problem but not because it lures students to plagiarize. This is an option that M and K-F highlights. K-F ironizes the possibility to hand in such a text. The joint laughter suggest that they are agreed about the futility of such an action. It would be easily spotted by their teachers. Instead a design problem is highlighted. Editing directly in the report is a problem because it may cause them to confuse the origin of their texts.

The finding of the study is in agreement with Pecorari (2003) who argues that students proceed to “the beat of a different drummer” (p 338). As Pecorari we find that students have many concerns when they write. In our data it is the technical separation of authorial voices that presents a dilemma and it is framed in such a way that it is reasonable to argue that the students know that they must distinguish between authors. Their talk implies that they are aware of the problem of plagiarism. At the same time however they are concerned with searching for usable information, making selections, turning patches into presentable synthesis and other activities that are clearly a part of their present project. On the question of plagiary data is in agreement with Howards (1995) assertions about patch-work writing. To her separation of authorial voice is a problem of mastery. It is difficult to maintain an

authorial voice if you do not master content. This may be true and it certainly was one of the problems the students confronted. The way technology animates student discourse in this text it is, however, coded as a problem of keeping the link between a text and its author. There is a technical problem that is highlighted and that prompts their discussion about authorial voice. Technical problems are commonly considered to be excuses or rationalizations used by students (Mallon, 1989/2001). They are surface as common explanations used by students in Swedish disciplinary inquiries (Nilsson, 2005; Nilsson, Eklöf, & Ottosson, 2005).

Alexandersson and Limberg (2004) argues that writing problems are augmented by new technology. Students use technology to transport and transform. In their study, however, there is little evidence that students highlight this as a problem with technology rather than with how assignments are framed in their schools. Instead they are aided by teachers who help them work on the surface of texts. Much in our small piece of data points towards the conclusion that technology plays a part but not in mediating plagiarism or to transport and transformation of text. These students like Pecoraries proceed to “the beat of a different drummer”. This drummer suggests that authorial voices must be kept separate and that the features of technology may make that difficult. They also reveal that they are aware that the report generator is designed to be a repository where they can play with the texts before they generate their report.

Historically notebooks have been used in this way by authors. It may serve as a reminder that Mallon (1989/2001, p. 29f) discusses the notebooks of Coleridge and many other authors in the same fashion. “Notebooks were the place where things read could be safely hoarded and played with” (p. 29), and because of their private nature confusion and sloppiness could be an excuse. Mallon however does not suggest that this use of notebooks can be excused. In our data students are guided by an understanding of authorial voice that is different and displayed through the way technology is highlighted. Learning, as suggested

earlier, is always to some part contingent. It is entirely possible that other students, for example Pecoraris (2003) students, following the beat of yet a different drum would have learnt to use this technology in a different way.

To summarize and conclude, students in our study used a software called the Researcher to build up and generate reports. Using this software they highlighted the problem of connecting texts to their authors. While they had considerable problems figuring out how this should be done it was clear that they were guided in their interpretation by a school code that says that authorial voices must be separated. This influenced their way of seeing. Returning to the student who did not want to correct her English she learnt to see use of technology as something that could cause her to be accused of cheating. Educational environments affords many ways of seeing technology. An important conclusion is that design does not decide how technology is used. Instead affordances of technology surface as a dilemma every student needs to confront in practice, seeing technology through their “socially situated and historically constituted body of practices”. This is student vision.

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