

Dental Students' Notetaking: a Thematic, Material-based Interview Study

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Abstract

Background: The transition from upper secondary to higher education and from higher education to professional practice requires that students need to adapt to new literacy practices, academic and professional. The aim of this study was to identify what characterizes dental students' notetaking and secondarily to determine what dental students express regarding their notetaking.

Methods: Three undergraduate dental students participated in this material-based, semi-structured interview study, that was framed within a New Literacy Studies approach. To analyze the outcome of the interviews a thematic analysis was used.

Results: Eight themes that relate to *what*, *how* and *for what purpose* students write were discerned. These include **a) what:** T1-Professional vocabulary; T2-Core content; T3-Clinical example; **b) how:** T4-Multimodal accentuation; T5-Synthesis; and **c) for what purpose:** T6-Mnemonic strategies; T7-Academic purposes; and T8 professional purposes.

Conclusions: Findings from the interviews indicate that the digital development, offering a variety of available tools, has expanded the notion of notetaking. Thus, this study identified that dental students' notetaking has changed during their education from initially just being synchronous, to now also include both multimodal and asynchronous writing, making the notetaking more of a writing practice. Further, students' writing practices seem to be motivated by their knowledge formation in relation to a subject matter, but also in relation to their experiences during clinical training. Although our hypothesis was that the main purpose of notetaking and writing was to pass their course examinations, this study showed that students, half-way through their dental education, are aware that literacy practices are not only for passing their exams, but also for learning for their future profession.

Background

Literacy is part of learning in higher education where students are expected to read various types of texts, to write various types of texts, and to talk about texts in various situations. However, few students are familiar with the *literacy practices*, e.g. the genres of texts they are expected to read and write related to the professional as well as the academic language that are specific for the respective profession and the corresponding programme (1). Literacy practices in higher education is a field of research common for researchers from various disciplines, such as anthropology, education, engineering, linguistics, and sociology (2). Not only *what* you read or write, but also *how* you are expected to read and write, and for *what purposes* you read or write contribute to constructing what counts as valid literacy practices within a specific field, e.g. in this study dental professional literacy. In relation to these texts specific ways of communicating, in relation to and about these texts, develop and become established (3). Previous research shows that such literacy practices are socially and historically established, but also develop over time in relation to the scientific and technological development of relevance within or for the profession (4). In a similar way digital tools also contribute to changing students' reading and writing practices (5).

Changes in how we interact with various resources (e.g. teachers' knowledge, textbooks, notes) in various contexts (not only in educational contexts but also in everyday contexts) in combination with the technologies available (smart phones, computers, iPads, apps) "contributes to transforming our conceptions of what learning is" (5; p. 56). Furthermore, societal needs expressed in e.g. regulations that affect a profession also contribute to changes in literacy practices within a profession, which, in turn, affect literacy practices in education programmes (6).

Reading in Swedish dental education includes textbooks, national guidelines, research articles, PowerPoint-handouts, digital material (at the online-learning environment) such as learning tasks, course instructions and clinical instructions. Writing on the other hand includes notetaking, clinical documentation and tests (Lindberg et al. 2020, submitted). According to Lea and Stierer (7), appropriating new literacy practices requires that students have to adapt and use new ways of knowing, including new ways of understanding, interpreting, and organizing knowledge. When entering higher education, most students encounter specific academic literacy practices, i.e. context-specific ways of reading and writing for academic purpose. Students' experiences, in a teacher training programme, of the transfer from upper secondary school to academia was studied by Ask in 2007 (8). That study showed that it takes time to become acquainted with the new ways of reading and writing that teacher-students are expected to use and produce. In professional higher education, they also are expected to adapt to a professional literacy, which most often differs from the academic literacy. Also, this transfer has been found challenging in a study of nursing and engineering students (9). Consequently, professional higher education prepares not only for academic purposes of reading and writing but also for professional purposes of reading and writing (7). In this article, we specifically focus on students writing in one Swedish dental education during a specific course that comprises of four modules spread over four semesters, which starts during the fifth semester of the programme.

Students' writing has mostly been explored as part of assessment situations, and students' academic texts for assignments and exams are seen "as tangible products of the processes of reading and writing" (10; p. 389) while less attention has been paid to the practices preceding assessment. Such approaches result in an understanding of less successful students' writing as deficit, and the problem is interpreted as the failing student's problem, not as part of the teaching practice (11,12). Thus, in professional higher education students have a double task: to learn how to read and write different types of academic texts in ways that are acceptable, i.e. what counts as a good written representation of knowing within a specific context (7), but also to read and write texts used and produced *within* and *for* the profession in context specific acceptable ways. Furthermore, they need to be able to alternate between these types of texts but also to judge when to use which types of texts. Such findings have been summarized by Higgs (13) who argues that graduates in professional education are required to: **a)** have the abilities to access new information; **b)** judge the information applicability to their specific work setting; **c)** synthesize information

from multiple sources (i.e. verbal, printed, and digital); **d**) produce reports and presentations utilizing multiple forms of media; and **e**) use information and communication technologies as part of their learning and future professional practice; as well as **f**) having the ability to critique new information and determine its relevance to a given situation, i.e. in their future profession (which this study is not able to answer).

This is, to our knowledge the first material-based interview study regarding dental students' academic and professional literacy practices within higher education, where the interviews are based on the participants' actual notes. There is a previous interview study by Berthén and colleagues (11) in which students' experiences of their notetaking was investigated. That study identified significant differences between notetaking strategies relevant for successful studies in higher education and those less relevant. Relevant notetaking strategies characterized by students were: **i**) trying to identify the main focus of the lecture, **ii**) writing notes about both what the teacher says and about their own ideas of important issues relating to the purpose of the lecture, **iii**) writing complementary text for mnemonic purposes, **iv**) writing questions and thoughts related to the lecture, **v**) comparing their notes with those of fellow students or asking the teacher when something is unclear. Less relevant notetaking strategies were characterized by students writing: **1**) only what the teachers wrote, i.e. copying (Lindberg et al. 2020, submitted), thus not making any complementary notes like questions, headings; **2**) not comparing with fellow students or asking the teacher. Taken together, although students seem to have an awareness of relevant notetaking strategies used for a personal meaning-making of their notes, previous research indicate that students tend to use less relevant or less effective notetaking strategies.

Thus, to investigate the academic and professional literacy practices of students at an early stage of the dental education, this material-based interview study has two aims. The primary aim was to identify what characterizes dental students' notetaking, and the secondary aim was to determine dental students' beliefs regarding their notetaking. Our working hypothesis was that the main purpose of notetaking was to pass their course examinations.

Material And Methods

Context of study

To analyze the student-aspect of notetaking, three students that volunteered were interviewed in an anonymous set-up, hereby named Student 1, 2 or 3. The three students that were interviewed were registered in the module "Orofacial Pain and Jaw Function 2" which is part of the course "Clinical Odontology 2" (<https://utbildning.ki.se/course-syllabus/2TL016/24160>) during the third year of the Study Programme in Dentistry (SPD) at the Department of Dental Medicine at Karolinska Institutet. Since the context of the study has previously been described in detail (Lindberg et al. 2020, submitted), only a

summary will follow. At the time of data collection, the total number of full-time students at the SPD was 423, divided into approximately 85 students per academic year. The SPD is divided into ten semesters for five years, providing 300 European Credit Transfer and Accumulation System (ECTS). The first three years are on a basic level and the last two on an advanced level. During the course of the SPD, the students are expected to develop in their role as health-care providers, but also to learn about rules and regulations, quality assessments, scientific evaluations, and reflect upon present evidence (<https://ki.se/selma/programme-syllabus/2TL13>). After graduation, the students must apply for licensure from The National Board of Health and Welfare (<https://legitimation.socialstyrelsen.se/sv/utbildad-i-sverige/tandlakare>) to be allowed to work as dentist in Sweden.

At least three weeks prior to each lecture, teacher-constructed PowerPoints were posted at the online learning platform. During lectures, the students could choose to either write their notes by hand or on digital tools such as a laptops or tablets, on blank sheets or on the PowerPoint-handouts. In total 24 students volunteered to hand over copies of their notes (in total 237 pages). These were analyzed regarding method used for notetaking (digital and/or paper-and-pencil), types of notes (notes that consist of **1**) copied teacher-written texts; **2**) complemented teacher-written text; or **3**) a mixture of **1** and **2**.)

Material-based interviews

The interviews took place in October 2018 at the Department of Humanities and Social Sciences Education at Stockholm University by two of the researchers (VL, NCh). The interviews lasted 43.34 min for Student 1, 59.00 min for Student 2, and 114.12 min for Student 3. In order to secure confidentiality of the interview setting that was video recorded, the participants were instructed not to reveal any personal information during the interview. Further, the camera focused only on a table where the students' notes were displayed, and only the hands of the participants were visible. This because it was important for the researchers to be able to check what aspects of their notes each student emphasized, by pointing at a specific part of their notes (14). After completion of the interview, the volunteering students left an anonymized copy of their handwritten or digitally written notes from the lectures. These notes consisted of 11 pages from Student 1, 14 pages from Student 2, and 25 pages from Student 3. Further, they also left their digital summaries of the module content consisting of 34 pages from Student 1, 41 pages from Student 2, and 29 pages from Student 3.

This study was based firstly on students' notes, and secondly on material-based interviews with three of these students. Material-based interviews are basically a theoretical recontextualization of *think-aloud interviews*, originating from cognitivistic traditions, into a New Literacy Studies (NLS) tradition. In her study of teachers' assessment of nursing students' written tests, Orrell (15) interviewed teachers while they were reading and assessing students' responses. The interviews were mainly based on teachers

commenting students' responses aloud. The purpose of Orrell's study was to illuminate experienced teachers' cognitions during the action of assessment. However, the main idea in think-aloud interviews – to capture the thoughts of the individual interviewees – is problematic for studies that foreground the social practice. The idea that it is possible to claim that you can capture people's thoughts through interviews has been criticized, firstly based on e.g. Vygotsky's (16) work. According to him, thinking and speech are related to each other, but they are not the same. Secondly, an interview is a specific kind of conversation: the conditions differ from other kinds of conversations, and interviews also have limitations (17-19). An interview is a joint construction between interviewer and interviewee: each party have their interpretations of the meaning of the questions posed, but also aspects like what questions are not posed, which answers the interviewer will or will not pose follow-up questions, and what answers the interviewer supports or does not support by various kinds of facial expressions, gestures, humming etc. Most of these aspects are unconscious but can be identified when analyzing interview situations. Based on this critique, interview studies have been methodologically developed to contextualize the interview situation (14,19). Since dental students' notetaking is considered a social practice, we prefer material-based as the concept that describes both the kind of interview we used, but also the theoretical basis for what we claim based on these interviews: the data that are co-constructed.

In the present study the interviewers and interviewees, i.e. students, sat around a table on which the students' notes were placed, in a small conference room at Stockholm university, which is a familiar academic setting both for the interviewers and the interviewees. Before the actual interview, the students were instructed to speak freely, but to avoid details that could reveal their identity. They were informed that only their answers would be analyzed as well as the notes pointed out by their hands, hence, no facial or body expressions, gestures, confirmatory sounds etc. were to be analyzed. This, to make the interviewees as relaxed as possible. During the interview the students were asked to answer questions regarding their notetaking based on what, how, and why, that is for what purpose. Also, when appropriate, they were asked to highlight their answers with examples from their notes placed on the table. During the course of the interview the interviewers now and then added in with questions for further clarifications regarding any of the above mentioned aspects of notetaking.

Thematic analysis

Thematic analysis may be described as a method for identifying, analyzing, and reporting patterns in a data. Patton (20) and others (21,22) describe a thematic analytic process as progressing from a description in which data has been organized to reveal patterns of meaning, a summary, an interpretation that attempts to theorize the importance of the patterns, their general meanings and inferences. Thematic analysis is here combined with New Literacy Studies for the purpose of capturing patterned response or meaning within interview data that relates to students' notetaking. Prevalence is ensured by the

refinement of analysis, in themes and potential sub-themes. A theme is determined by what it captures in relation to the research questions. The themes created relate to the data, i.e. the interview transcripts of three students' notetaking, and were generated by a thorough, inclusive, and comprehensive coding process. Themes include data made sense of, i.e. interpreted, and not data paraphrased or described. Each theme has been described in detail and given a nuanced account.

The analytical procedure involved noticing patterns of meaning and issues of potential interest in the data. Also, analysis involved a relational reading, that is, a constant moving back and forth between the data set, the transcripts analyzed, and the analysis of data produced. The analytical steps performed in this study were as follows:

1. The first step concerned familiarization with data which was achieved in the process of transcription of the interviews, that also involved a reading and re-reading of data, and the noting of ideas.
2. In a second step, data for each student was coded in relation to interesting features, which here comprised of the following analytical questions: a) what do they write; b) how do they write; and c) for what purpose do they write?
3. In a third step, collating codes into preliminary themes, by gathering of relevant data.
4. In a fourth step, these themes were controlled in relation to the previously identified features and in relation to the entire data set. This additionally ensures that themes are internally coherent, consistent and distinctive. This controlling generated a thematic map of the analysis.
5. A fifth step involved the definition of each theme and their naming. The themes (*T1-T8*; Table 1) were: professional vocabulary, core content, clinical examples, multimodal accentuation, synthesis, mnemonic strategies, academic purposes, and professional purposes. Examples of multimodal accentuation are for instance when students use color for highlighting words or sentences as well as details in pictures, draw arrows between notes in different parts or on teacher-provided handouts.

6. The sixth and final step involved the selection of extract examples that vividly illustrated the themes. These selected extracts were then related back to the research question of the study.

Results

Results from this study showed that students usually write different types of texts (Lindberg et al., 2020, submitted) for the development of a complete understanding of the subject matter. Students' writing is motivated by the development of knowledge and understanding of a subject matter, but also for study achievement and future professional development and support.

Based on the analytical questions from NLS and the procedure from the thematic analysis (Table 1) the following themes were discerned based upon the questions: what do students write, how do students write, and for what purpose do students write?

Table 1: Overview of themes related to significant analytical questions (AQ) within New Literacy Studies (NLS).	
AQ1: What do students write?	
<i>T1: Professional vocabulary</i>	Concepts and/or descriptions
<i>T2: Core content</i>	Teacher accentuated content
<i>T3: Clinical examples</i>	Content related to clinical practice
AQ2: How do students write?	
<i>T4: Multimodal accentuation</i>	Strategies to accentuate content and relations. For instance, color coding, arrows, drawing pictures, pictures and images, upper case letters, tags, visual symbols
<i>T5: Synthesis</i>	Students combine PowerPoints from lectures and individual notes, including a presentation comprising a general and detailed structure, usually performed on a computer
AQ3: Why do students write?	
<i>T6: Mnemonic strategies</i>	Knowledge and understanding
<i>T7: Academic purposes</i>	Exam-preparation
<i>T8: Professional purposes</i>	Professional knowledge and support; a) clinical skills as student and dentist b) the development of professional literacy

What do students write?

Three recurrent themes were identified in relation to what students write. The students wrote complementary text that comprised of: *T1*) professional vocabulary; *T2*) core content; and *T3*) clinical examples. Complementary text included information exceeding what was presented in the PowerPoints. Examples of the complementary text were teacher examples that related to the content in the PowerPoint, for instance clinical examples that vocationally or clinically contextualized teaching and learning content. For instance, Student 3 noted a simile provided by the teacher where Posselt's trajectory was compared to the shape of a banana. Student 3 argued that additional information provided by the teacher during lectures, supports memorizing, and is therefore noteworthy.

Professional vocabulary, i.e. concepts and descriptions, involved the simplification or description of terminology or other phenomena in accordance with students' individual and everyday language. An example was that Student 3 added the verb 'movement' for further describing 'exaggerated protrusion of the mandibula'. The same student also added 'goes back and forth' to describe the terms 'protrusion' and 'retrusion'.

All three students discerned core content, i.e. central, recurrent and accentuated (e.g. intonation) content by the teachers during lectures. An example from all three students was the word 'toxic', another was 'pain' and 'peripheral sensitization' that were accentuated by the teachers. Another example described by the three students was the repetition that patient anamnesis was a significant source of information for treatment.

Clinically relevant content was provided to students based on teachers' experiences, i.e. examples from their clinical practices. Teacher-examples were occasionally further supported by drawings on the whiteboard. Students copied these drawings into their own notes (Figure 1).

How do students write?

Two themes were discerned in relation to how students write, and these were: *T4*) multimodal strategies; and *T5*) syntheses. Multimodal strategies that students used aimed to support memory, and to aid their understanding of the subject. Strategies comprised of various color coding; accentuation through different types of markings, such as squares, bolding and exclamation marks; arrows marking movement or leading to various descriptions; drawing own pictures, or adding pictures and images for further explanation of content in text; upper case letters; tags; visual symbols for instance marking female and male gender. For instance, Students 1 and 3 used black color as basic color for noting, while other colors signified different things (Figure 2). Student 2, on the other hand used red color for marking words, concepts or other information that needs to be further controlled and thus clarified as an adequate explanation that was not provided in the lecture itself. After the lecture, all three students either looked up in books, searched the internet or called a course-friend to ask. Student 3 also used yellow highlight to mark something important, while pink highlight to mark concepts and terminology. Further, both Students 2 and 3 express that their notetaking has changed over time. From just being synchronous handwritten notes on blank papers or on printed handouts based on the teacher-constructed PowerPoints, to asynchronous and multimodal. This is illustrated by an excerpt from the interview with Student 3 (interviewed 2018-09-25, authors' translation):

I have used notebooks for long time and think it works well resulting in good results in exams, but people around me uses computers and tablets. But sometimes I could not read my notes, and it goes faster with the computer. What I am lacking with my handwritten notes are the coloring, but there are other advantages with the computer. /.../ so I have changed my way of writing notes.

Student 3's synthesis comprised of a multimodal combination of PowerPoint-handouts from lectures, additional teacher information from lectures summarized in Word-documents, and students' individual complementary handwritten notes on tablets, referring to specific page on PowerPoint-handout (Figure 3). All three students often complemented the notes with a synthesis soon after the lectures, as a mnemonic strategy to increase the chance of remembering details from the lecture. The student synthesis was a structured summary of the subject, in terms of both general and detailed information. These syntheses helped the students to reach a broader and deeper understanding of the subject.

Why do students write?

Three themes were identified for the question of why students write: *T6*) mnemonic strategies; *T7*) academic purposes; and *T8*) professional purposes (Figure 1). Students notetaking as a mnemonic strategy, was presented by all three students as clarifications of vocabulary, examinations, diagnoses as well as procedures, to helping the three students to relate different information to each other. Thus, the three students connected different parts of a subject to create a holistic understanding of the content.

Also, all three students used the notetaking and constructed syntheses to pass their exams and thus explicitly to achieve the learning objectives set for the educational programme. According to all three students, notetaking was an essential part of preparing for examinations. They emphasized that notetaking requires understanding of what is noted and understanding of how and why things are connected within a subject.

In terms of professional purposes, the three students interviewed expressed an awareness of the literacy related demands in the dentist profession. Thus, they all considered reading different types of texts and writing as part of a professional development and highly relevant as preparation for their future profession as dentists.

Discussion

This study shows that the technical advancement with the digital tools that were provided on the online learning environment as well as those tools, such as laptops and tablets, the students chose to bring to the lectures, resulted in evolved literacy practices. In relation to text-genres we found that students' notes related to three genres: **a)** the dental academic language needed for exams and presentation with

teachers as the receiving part, i.e. anatomy, physiology and pathology/diagnoses related to textbooks and teachers' handouts, that also is the basis for their future professional terminology; **b)** professionally specific language in national and international guidelines for dentistry as well as diagnostic protocols to be used as tools for professional judgement and diagnosis; and **c)** professionally specific language to be used in clinical contexts with other dentists, caregivers and patients as receiving parties. Specific for this last genre is that these professional texts are to be written but they are often also used as a basis for oral communication with the mentioned receiving parties. In comparison to Dias and colleagues (9) the three literacy genres the dental students needed to appropriate, within the frame of the studied modules, seem to be more in agreement with the professional demands, than Dias and colleagues (9) found for nursing and engineering students. A point to be made, though, is that it is also expected that some of these dental students will have a future career in academia.

In relation to Berthén and colleagues (11) our findings confirm that most of the notetaking strategies are relevant for higher education and future professional practice: the interviewed students tried **1)** to identify the main focus of lectures; **2)** took notes related to what the teachers said; and **3)** added notes about their own ideas of important issues related to the purpose of the lecture, which were based on what was emphasized during the lecture or by the teachers' clinical experiences. Furthermore, they wrote complementary texts for mnemonic purposes and posed questions for clarification to the teachers during as well as after the lectures. The students also summarized their notes afterwards including their own thoughts or questions to teachers, that represents a kind of personalized synthesis of the core content – not only of the teachers' words, which is valued as an indication of higher-order cognitive knowing (23). However, none of the interviewed students deliberately compared their notes with those of fellow students, but they expressed that they occasionally borrowed notes or asked another student if they found something unclear. All three students also copied teachers' PowerPoints to some extent, but copying was complemented with other strategies.

Studies on dropouts from higher education (24) show that the response rate from less successful students, even in questionnaires, is quite low. Our assumption is that these students' notes represent firstly successful students' notes, and secondly that Swedish is their native language. This can be seen as a methodological problem, since less successful students and students with Swedish as second language can be surmised to hesitate to share their notes.

Conclusion

This study aimed to identify what characterizes dental students' notetaking and secondarily what dental students' express regarding their notetaking. Findings from the interviews indicate that the digital development, offering a variety of available tools, has expanded the notion of notetaking. Thus, this study identified that dental students' notetaking has changed during the course of their education from

initially just being synchronous, to now also include both multimodal and asynchronous writing, making the notetaking more of a writing practice. Secondly, students' writing practices seem to be motivated by their knowledge formation in relation to a subject matter, but also in relation to their experiences during clinical training. Although our hypothesis was that the main purpose of notetaking and writing was to pass their course examinations, this study showed that students, half-way through their dental education, are aware of that literacy practices are not only for passing their exams but also for learning for their future profession.

In conclusion: **1)** teachers can use communicative strategies (how to talk about content in texts) for the development of a professional language as well as notes for professional purposes; **2)** the technical advancement with the digital tools that are provided has resulted in evolved literacy practices, e.g. multimodal notes; **3)** when planning new courses the course designers should take into account the digital literacy opportunities provided; and 4. course designers are recommended to analyze their students' literacy practices and take them into account when designing new courses or improving existing courses.

Abbreviations

ECTS European Credit Transfer and Accumulation System

NLS New Literacy Studies

SPD Study Programme in Dentistry

Declarations

Ethics approval and consent to participate

Based on the study set-up, there was no need for any ethical application. This is based on the Swedish law, SFS 2003:460 (25), that states that ethical approval by the Swedish Ethical Review Authority is required only for projects involving physical interventions, biological sampling, or projects that might affect the participants in any possible physical or psychological way, or if the project treat sensitive personal data or personal data about law violations. After consulting the Swedish Ethical Review Authority no such material was handled in this project since there was no risk for the participants to suffer any physical or mental harm, nor any sensitive or personal information be collected. All participating individuals volunteered by contacting the principal investigator themselves showing interest for participation. All participants gave their consent prior to inclusion.

Consent for publication

Not applicable

Availability of data and materials

The materials used and analyzed during the current study are available from the corresponding author on reasonable request

Competing interests

The authors have collected and analyzed the material alone and declare that they have no competing interests.

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Authors' contributions

All authors (**VL, SLJ, MCh, NCh**) contributed to the study conception and design. Material preparation, data collection and analysis were performed by **MCh** and **SLJ**. The first draft of the manuscript was written by **VL** and **NCh** and all authors commented on previous versions of the manuscript. All authors have read and approved the final version of the manuscript.

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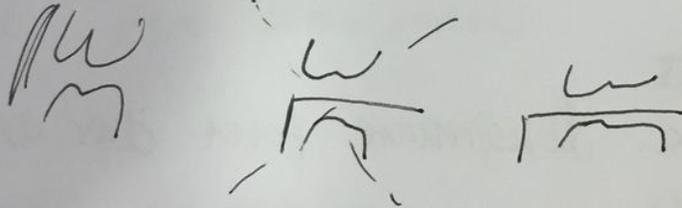
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Figures

Runda av kanter
kontrollera att pat kan patta in den själv
ktrl. att patienten inte biter sig i kinden.
UK - Hela för bygga ut så kinden håller ut



Allergi: metylmetakrylat:
Nylonbaserat Valplast (dålig passform)
Kingskener

Mjuk bettskener

Figure 1

Photocopy of student 2 handwritten notetaking. This shows notetaking for professional purposes. The notes have a clinically relevant content regarding the adjustment and delivery of an occlusal appliance, a common treatment for orofacial pain conditions. In the middle of the note the student added teacher-examples by copying the teacher's drawings on the whiteboard.

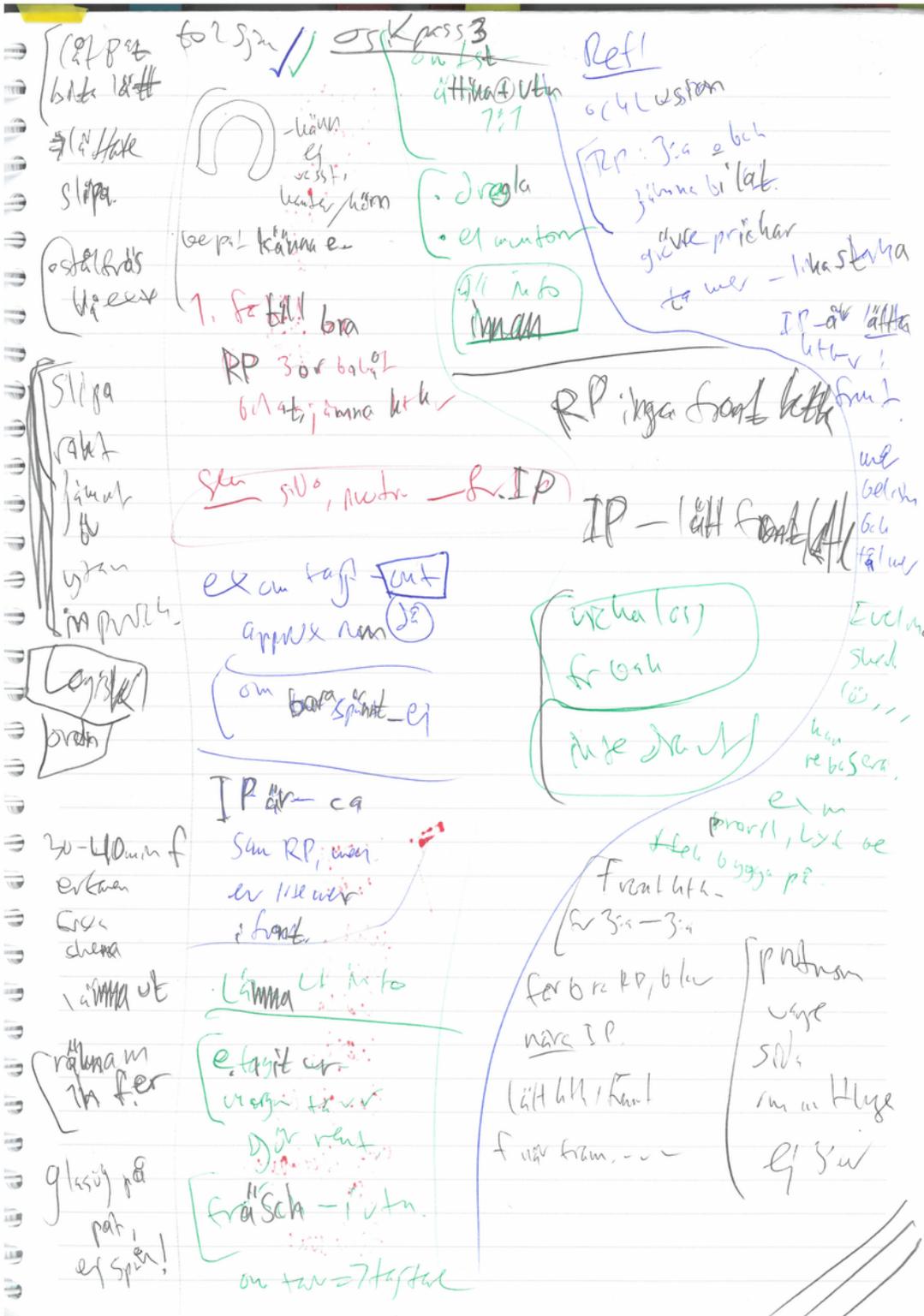


Figure 2

Photocopy of student 1 handwritten notetaking. Student 1 uses black color as basic color for notetaking, and three to four other colors in order to signify different things. The color was then used to group information about the same topic, for instance blue to clarify, green for professional purposes, and red to highlight important clinical aspects.

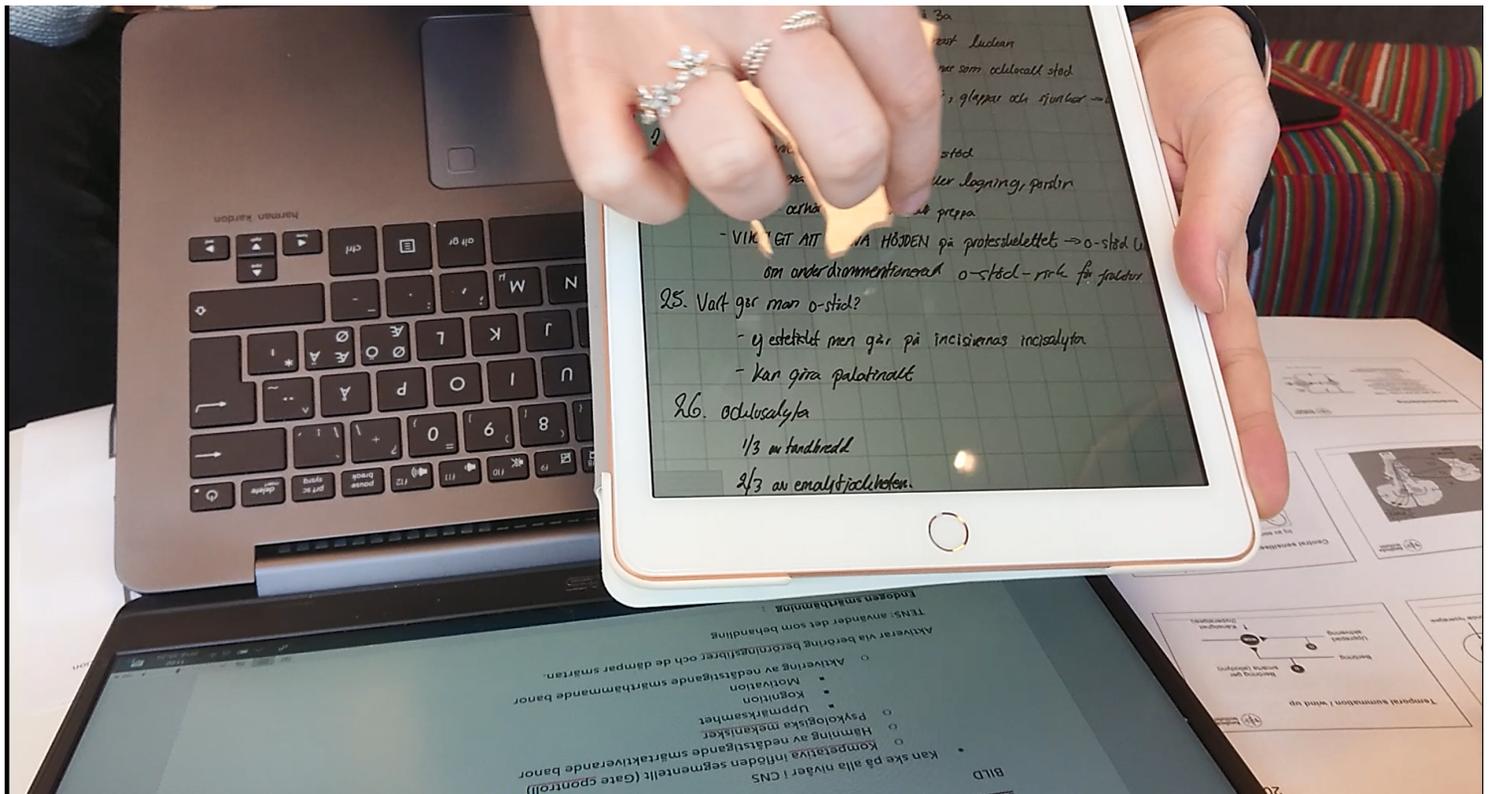


Figure 3

Photograph displaying student 3 demonstrating a multimodal combination of notetaking. The notetaking is based on a) PowerPoint-handouts from lectures at the lower right part of photograph; b) teacher information from lectures summarized in a Word-document at the computer screen at the lower border of the photograph; and c) individual complementary handwritten notes on the tablet, in the middle of the photograph, that refers to the specific page at the PowerPoint-handout at the lower right part of photograph.