Shapes of Knowledge

A multimodal study of six Swedish upper secondary students’ meaning making and transduction of knowledge across essays and audiovisual presentations

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Abstract

This comparative study examines essays and audiovisual presentations made by students, using English as a foreign language, in a digital learning environment. The aim of the study is to describe and understand six Swedish upper secondary students’ digital written and audiovisual text production in English, with a specific focus on representation in different modes. The study uses a framework of multimodal social semiotics (Halliday, 1978; Kress, 2010; Kress & van Leeuwen, 1996/2006) and multimodal transcriptions as tools for processing and interpreting data. Analyses of the essays and audiovisual presentations involve form and content, and the study employs multimodal analysis to investigate affordances and constraints for making meaning and shaping knowledge, and visualizations of transduction of knowledge. Results show that students appear familiar with constructing written text, but have to create their own structures for audiovisual text, where the familiar logic for constructing written text is both a help and a hindrance. The medium of audiovisual text opens up for more engagement and emotions compared to written text. It has more means for structuring and creating cohesion than does written text, which becomes visible in how the students’ texts are transduced, and transformed, across essays and audiovisual presentations.

Keywords

Audiovisual text, knowledge representation, meaning making, modes, multimodality, multimodal social semiotics, shaping knowledge, transduction, written text.
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Chapter 1 Background

1.1 Introduction

In the wake of new digital landscapes society is changing, and education systems are following suite (Johnson & Kress, 2003). In 1996 the New London Group published "A pedagogy of multiliteracies: Designing social futures" where they argued that schools need to take into account text created using digital technologies, and that increasing cultural and linguistic diversity creates a need for a broader view of literacy. From this view of literacy follows a concept of text extending beyond the notion of writing on paper. The prevalence of digital learning environments in schools has since increased markedly, which is rapidly changing educational landscapes (Ananiadou & Claro, 2009; European Schoolnet & University of Liege, 2013; Government Offices of Sweden, 2017; Hallman & Haglund, 2017; Heath, 2016; Hernwall, Bergström, Graviz & Nilsson, 2012; Hillman & Säljö, 2016; Jewitt, 2005; Johnson & Kress, 2003; New London Group, 1996; Organisation for Economic Co-operation and Development [OECD], 2017; Government of Sweden, 2014; Swedish National Agency for Education, 2013). In Sweden, schools are increasingly working in digital environments (Tallvid, 2015) where every student and teacher have access to their own laptop. This is making it possible, even easy, for students to make audiovisual representations of knowledge. In shaping audiovisual texts students are working with transduction when they translate or remake meaning across modes (Kress, 2010, 2017; MODE, 2012).

In this study the concept of text is used, as defined by Kress (1998, 2003, 2010), to refer to combinations of several modes (Halliday, 1978; Kress, 2010; Kress & van Leeuwen, 1996/2006). This concept of text includes, but is not limited to, the mode of writing. The transition from learning environments where the written mode and text on paper is dominant (Kress & van Leeuwen, 2006) to digital learning environments actualises questions about the effects these changes have on knowledge and learning, which is a motivation for this study. Although digital tools offer more ways to learn, and represent knowledge beyond writing, the verbal written medium "is firmly coded and buttressed in conventional histories of writing" (Kress & van Leeuwen, 2006, p. 21). Subjects where writing has been shown to (still) be a dominant mode include English (Jewitt, 2011; Jewitt & Kress, 2010; Kress, Jewitt, Bourne, Franks, Hardcastle, Jones & Reid, 2005) and history (Insulander, 2017). While the focus in this study is placed on making meaning and transduction, both the subjects are relevant for this study, where the empirical material consist of essays and audiovisual presentations made by students in the subject English, on a topic of (contemporary) history. The study uses a multimodal social semiotic perspective, where knowledge and learning are seen as interdependent and context dependent processes (Jewitt, 2014a; Kress, 2010; Kress & Jewitt, 2010; Kress & van Leeuwen, 2006). However, knowledge can be represented in many ways including multimodal digital formats. This opens up for issues about equivalence in education and multiculturalism, as well as for questions about the dominant status of the verbal written medium over visual forms of media.

Multimodal and digital forms of expression could prove advantageous for students with different linguistic backgrounds, and for students who come from communities without traditions of (higher) education. Vincent (2009) showed that 'low level’ students improved their performance when using multimodal ways of expression. Other scholars who have emphasised the need to address the advantages of multimodality in learning and education include (among others) Bezemer and Kress
Students’ multimodal digital representations of knowledge are interesting as these open up a wider window (Kress, 1998; Jewitt, 2014b) to the students’ knowledge compared to the more limited modes of speech and writing. Studies that focus on transduction (Kress, 1998, 2003, 2017), also referred to as transmediation, include Höglund (2017), Smith, Kiili, and Kauppinen (2016), and McCormick (2011). In this study the term transduction, rather than transmediation, will be used.

1.2 Aim and research questions

The aim of this study is to describe and understand six Swedish upper secondary students’ digital written and audiovisual text production in English, with a specific focus on representations in different modes. Three research questions will be asked;

1. *How do students make meaning and represent knowledge (about civil rights in the English speaking world) in their written essays and audiovisual presentations?*
2. *What are the affordances of written essays compared to audiovisual presentations for representing knowledge (about civil rights)?*
3. *How can the students’ text production be understood in terms of transduction?*

1.3 Structure and layout

This thesis is organised into five chapters. Chapter one presents the starting point of this study, which is changing educational landscapes, and a border view of literacy and text. The theoretical perspective multimodal social semiotics (Jewitt, 2014b; Kress, 2003, 2010, 2017; Kress & van Leeuwen, 1996/2006, 2001; van Leeuwen, 2005) is introduced, as is the focus of the study, which is meaning making and transduction, followed by the aim of the study, and the three research questions, and lastly the structure and layout of the text.

Chapter two states the ontological and epistemological presuppositions of the study and the theoretical framework used. Multimodality is explained as a concept for an integrated multimodal whole, where meaning is made with semiotic resources, which offer different affordances and constraints (Bezemer & Kress, 2016; Jewitt 2014c; Jewitt, Bezemer & O’Halloran, 2016; Kress, 2010, 2017). Multimodal social semiotics and central concepts are explained and defined, and knowledge and representation are given a clarifying section. Chapter two also presents previous research relevant for and preceding this study in the areas of digital learning environments and language learning (Hafner, 2014; Jewitt, 2011; Kress et al., 2005; Mestre-Mestre, 2015; Ranker, 2015; Svärdemo Åberg, Åkerfeldt & Selander, 2013; Åkerfeldt, 2014), and transduction and comparative methods (Birdsell & Groarke, 2007; Höglund, 2017; McCormick, 2011; Smith, Kiili & Kauppinen, 2016; Whitin, 2006). Studies that were used as inspirations for the construction of comparative methods and of categorisation, such as Smith et al. (2016), are introduced in this chapter. The chapter ends with a short discussion on theory and previous research in relation to this study.

Chapter three motivates, explains and describes methodological choices, the construction and the realisation of the study. This includes research design, delimitation of the study, the context and produced data, (in this study data is seen as produced rather than collected), and how data is processed and analysed. Transcriptions, examples of transcription matrices and visualisations of transduction are shown in figures. How the ideational, interpersonal and textual metafunctions (Halliday 1978; Kress &
van Leeuwen, 2006) are used as analytical tools is explained, as is the system for descriptive and analytical categorisation and colour coding. Trustworthiness of the study, quality and rigour (Golafshani, 2003; Moss, Phillips, Erickson, Floden, Lather, & Schneider, 2009) are discussed here. Ethical considerations in relation rules and regulations of the Swedish Research Council (2018c) and the European Code of Conduct for Research Integrity (All European Academies [ALLEA], 2017) ends the third chapter.

In Chapter four the research questions are answered and results of analyses are given. First the empirical material, the students’ essays and audiovisual presentations, is described, followed by the descriptive results. This first analysis targets meaning making and representation of knowledge, and uses the metafunctions of language and communication (Halliday, 1978, Kress & van Leeuwen, 2006) as tools for analysis, answering research question one. The second analysis is used to answer research question two and targets differences in affordance between essay and audiovisual presentation for representing the same knowledge (ideas), where both medium and modes carry affordances and constrains and material affordances encourage certain shapes of knowledge over others (Jewitt, 2014b; Kress & van Leeuwen, 2006; Kress, 2010, 2017). The third analysis is targeted at revealing transduction processes across the students’ written and audiovisual texts, and uses the metafunctions of language as starting point for analysis three, and later as a basis for discussing the third research question.

Chapter five picks up the discussion from digital learning environments, change and theory. The significance of the results and the answers to the three research questions is then discussed. This is followed by reflections on the research process, credibility, results and conclusions and possible future research. Chapter five ends with a summary of the thesis in Swedish.
Chapter 2 Theory and previous research

Ontological and epistemological presuppositions in this study include the views that meaning is something constructed and context dependent. It is here assumed that human processes of knowledge and learning are interdependent, context dependent (Jewitt, 2014b, 2014c; Kress, 2010; Kress & van Leeuwen 2006), and context specific phenomena (Golfsahi, 2003; Moss et al., 2009; Selander & Kress, 2010), and that there exist “shared social, semiotic, communicational principles and dispositions - which include the linguistic as one instance” (Kress, 2010, p 10). A multimodal social semiotic framework provides tools for analysing written and audiovisual texts, where students, in a process of making meaning, produce signs using different semiotic modes and representational resources. By making visible the processes of shaping knowledge, it becomes possible to understand and analyse the interdependent concepts of knowledge and learning (Halliday, 1978; Jewitt, 2014b; Kress 2010; Kress & Van Leeuwen, 2006).

2.1 Multimodality

Multimodality is a concept, which is used within different disciplines (Bezemer & Kress, 2016) and is less a theory, but more of a methodological approach. Multimodality can be viewed as a perspective, or a field of research questions that “is strongly underpinned by social and cultural theories of representation and communication” (Jewitt, 2014b, p. 5), or it can be described as a concept that maps out a domain. Epistemological perspectives can vary, as in how to delimit meaning making, but the original versions of the concept, such as Kress and van Leeuwen’s (1996, 2001), are all based on the assumption that multimodality includes cultural and social resources, which work together in making meaning (Jewitt et al., 2016). Kress describes multimodality as ”representation in many modes, each chosen from rhetorical aspects for its communication potential” (Kress, 2010, p. 20). Generally speaking, multimodality is a concept for an integrated multimodal whole, where the total is more than the sum of the parts, and where meaning is made with semiotic resources that offer different affordances and constraints (Bezemer & Kress, 2016; Jewitt 2014; Jewitt et al., 2016; Kress 2010), and where communication, representation and interaction are understood as more than verbal language. This means the understanding of the concept language is extended to include a range of modes for making meaning, beyond, but not excluding the verbal (Bezemer & Kress, 2016; Jewitt, 2014b; Kress, 2010, Kress & Van Leeuwen, 2001; van Leeuwen, 2011). Broadly speaking, for research within multimodality the approach ”provides tools for analysing and describing the full repertoire of meaning-making resources, which people use to communicate and represent . . . and how these are ‘organized’ to make meaning” (Jewitt, 2014b, p. 16). Jewitt (2014c) describes three main perspectives in the field of multimodality, social semiotic multimodal analysis, multimodal discourse analysis (or the systematic functional approach) and multimodal interaction analysis. However, as with any constructed categories and divisions the borders are not fixed or set. For all perspectives in multimodality there are elements of common ground, such as the use of fine grained analyses, understanding details in texts and interactions, a focus on meaning making as being social and
semiotic, the place of language in a multimodal ensemble, and a broadening of the concept communication as going beyond language. Differences across multimodal approaches involve how mode and semiotic resource are articulated, kinds of data studied, types of questions asked, as well as emphasis given to context, internal relations within modes or modal systems, agentive work of the sign-maker and whether the focus is placed at micro or macrolevels (Jewitt, 2014c). In this study a multimodal social semiotic perspective is used.

2.2 Multimodal social semiotics and central concepts

One basic presupposition in multimodal social semiotics is that language and its functions, is changeable and context dependent (Halliday, 1978; Kress, 2010), another that communication, however it takes place, is multimodal (Kress, 2010). When language is not seen an objective mirror of reality (Rorty, 1992) one consequence for research is that key concepts can vary in meaning between different research fields and paradigms (Moss et al., 2009). From this follows that the usage of any concept, which may have diverse connotations has to be defined for each case or study. In this study it has been presupposed that all human communication is accomplished through semiotic choices that signify wider sets of associations, which may be implicit (Machin & Mayr, 2012); communication is seen as semiotic work, where “interpretation is the defining criterion of communication: only if there has been interpretation, has there been communication” (Kress, 2010, p.35). Another central idea is that knowledge is given shape in representations, where makers of representations are seen as shapers of knowledge (Kress, 2010, p. 27). The main theoretical function of social semiotic multimodality is to supply analytical frameworks for explaining and understanding how meaning is made using different modes (Halliday, 1978; Kress & van Leeuwen, 2006). Certain core assumptions apply to both the linguistic use of social semiotics and multimodal social semiotics, such as communication viewed as meaning making in social contexts using complex signs (Jewitt, 2014c).

The social semiotic approach to multimodality is associated with the work of Kress and van Leeuwen (1996/2006, 2001) and van Leeuwen (2005), who opened up for multimodality with their work on visual communication (Kress & van Leeuwen, 1996), when they expanded Halliday’s (1978) metafunctions of language to include visual modes (Jewitt, 2014c). Kress and van Leeuwen (1996/2006) show that visual semiotic resources, just like verbal language, carry meaning potential and are used to communicate discourses and embedded ideologies (Jewitt, 2014c). Kress and van Leeuwen (1996/2006) do not make any universal claim, but only account for images in Western society, fully acknowledging regional and social variations, and assume a continuum from artistic imagery to the everyday communicative uses of images, arguing that there are ideological implications for what is included or excluded in images, and that verbal and visual communication both realise the same systems that constitute our culture(s) but independently and with their respective and specific forms. Meaning is not simply a result of what an image depicts but also comes from how it is depicted materially. The social semiotic multimodality of Kress and van Leeuwen, and associated works and studies, not only build on and expand the work of Halliday, but also on work situated in interactional socio-linguistics such as Goffman’s, Bateson’s and Hall’s, as well as iconography, music, film theory, history of art, and cognition and perception, and in the background there is influence from sociologists such as Foucault, Bernstein and Bourdieu (Jewitt, 2014c). Scholars, such as Jewitt (2014c), Kress, Jewitt, Ogborn and Tsatsarelis (2001), Kress et al. (2004), Kress and van Leeuwen (2001) Kress (2003, 2010) and van Leeuwen (1999, 2005), have since further expanded social semiotics into
multimodal perspectives, studying a range of modes, where emphasis is on the social context of communication together with how the sign-maker chooses and shapes signs to make meaning, and the situated use of modes, or modal resources and context; what choices people, as sign-makers, make is studied and "the non-arbitrary and motivated character of the relationship between language and social context" (Jewitt, 2014c, p. 33). Social semiotic multimodality uses social semiotics (Halliday, 1978) as a starting point, but expands the theoretical framework beyond verbal language. The social semiotic according to Halliday is the context in which we "learn to mean" (Halliday, 1978, p. 125) and in which all our subsequent meaning takes place.

In Halliday’s (1978) social semiotic theory of language, Halliday (1978) argues that text should be understood as complex signs, which are material instantiations of ideational, interpersonal and textual metafunctions (Jewitt, 2014c). In other words, texts realise the metafunctions. According to Halliday (1978) the ideational metafunction is the content function of language and represents the speaker’s meaning potential. The ideational function represents how language encodes the cultural, and the individual’s experience as part of a culture, where Halliday describes culture as an “infinitely complex network of meaning potential” (Halliday, 1978, p. 5). In Kress and van Leeuwen’s expanded use, which includes visual modes, the ideational function deals with how semiotic systems refer to objects in the outside world, and how these interrelate (Kress & van Leeuwen, 1996/2006). Ideational meaning can sometimes be referred to as experiential meaning or logical meaning. The interpersonal metafunction of language (Halliday, 1978) can be described as the social functions and relationships between the sign-maker and people engaging with these signs. Hence, the interpersonal metafunction deals with how a sender and a receiver of a sign relate (Kress & van Leeuwen, 1996/2006), and represents how the individual places him/herself in the context of a situation, and expresses roles that are associated with the situation. Interpersonal meaning is at times referred to as orientational meaning (Jewitt, 2014b). The textual metafunction is active in how communicative resources, such as written and audiovisual texts, are organised creating cohesion and coherence in relation to situation and context. In the expanded use the textual metafunction refers to the available options for forming complexes of signs, or texts (Kress & van Leeuwen, 1996/2006). Textual meaning can also be referred to as organisational meaning (Jewitt, 2014b). Meaning potentials are different types of meaning that texts realise where the textual metafunction is one such type of meaning. Ideational and interpersonal meanings are actualised in combination with textual meaning (Halliday, 1978, p. 113), and organised into multimodal texts drawing on "the textual resources of a mode" (Jewitt, 2014b, p. 25). In other words, metafunctions are generalised functions, areas of meaning potential that are built into language and communication, and form the basis of how the entire linguistic system (Halliday 1978), or visual communication systems (Kress & van Leeuwen 1996/2006) are organised. Although based on Halliday’s (1978) theory Kress and van Leeuwen (1996/2006) use a somewhat different terminology for meaning and metafunctions in visual communication, where representational corresponds to ideational, interactive to interpersonal and compositional to textual meaning (Liu, 2013). Making meaning involves semiotic work, which we can understand as "all processes which are part of the making of meaning" (Kress, 2010, p. 121). For representational (ideational) meaning in conceptual images, Kress and van Leeuwen (1996/2006) distinguish three characteristic processes classificational, analytical and symbolic. The process of classification is active in all semiotic work or resources where effect of classification "is to stabilize the social world in particular ways" (Kress, 2010, p. 122). The analytical process is active in making sense of interrelationships of (visual) conceptual elements and important in the interpretation of multimodal texts (Liu, 2013, p. 1262). The symbolic processes in what an image (or a sign) means as something other than what is shown (Kress, 2010; Kress & van Leeuwen 2006; Liu, 2013). Processes in action when making meaning reflect conceptual rather than
narrative representation (Kress & van Leeuwen, 2006) and are by Kress and van Leeuwen applied to images. Here in this study the use will of these concepts is expanded to include conceptual ideas where the modes can be visual and/or verbal, including both speech and writing. Both the concepts text and mode will be used in this thesis, where text is in this study should be understood as complex signs (Jewitt, 2014c) referring to combinations of several modes (Halliday, 1978; Kress, 1998, 2003, 2010; Kress & van Leeuwen 1996/2006, 2001). The concepts written text and audiovisual text be will be used for when the format or medium is discussed while the words essay and audiovisual presentation are used for the material representations of knowledge.

The concept mode is used to describe a channel for communication, or representation (Bezemer & Kress, 2016; Jewitt, 2014b; Kress & van Leeuwen, 1996/2006, 2001), expanded beyond linguistic communication, including the visual while not excluding language; examples of modes include writing, image, speech, gaze, layout, and gesture. For something to be able to function as a mode it needs to be able to realise all metafunctions (Kress, 2010). Mode can be defined as a set of resources for making meaning, which are shaped socially and culturally (Jewitt et al., 2016). Modes are configured together in multimodal orchestration, or compositions of modes, which can be studied to understand how cohesion is realised in (multimodal) texts (University College London Institute of Education, 2012). Modes are seen as subject to change and not universal, autonomous or fixed (Kress, 2010). Different modes carry their specific histories and communicative affordances, and modes interact when (multimodal) meaning is being made, each mode potentially more or less suited to the communicative task at hand (Jewitt, 2014; Kress, 2003; van Leeuwen, 2005). Modal affordance (Kress, 2010) refers to what is possible to express and represent using a particular mode. The affordance of a mode is shaped by the mode’s materiality and by social norms governing modal use. The affordances of modes have certain logic constraints, which depend on the contexts in which the mode is, and has been, used. In other words, modal affordance is context dependent and subject to historicity and culture(s) of usage. The concept affordance can be applied to more than modes. A particular resource, or an artefact also carries affordances making these more or less suited for certain types of communication and meaning making (Kress, 2010; van Leeuwen, 2011). Moreover, there are logic constraints that are material and tied to temporality, sequentiality and space. Each mode carries certain logics, for example speech is subject to the sequence of time, we can only say one word at a time, while images are subject the logics of space (Kress, 2010; MODE, 2012). Modes have semiotic features (Bezemer & Kress, 2016), such as salience and intensity, cohesion and coherence (Kress, 2017, p. 41), but the concept mode is not synonymous with semiotic resource. Semiotic resources are means for making meaning, which are simultaneously material, social and cultural (Kress, 2010). Hence, semiotic resources have meaning potentials shaped by their past uses and carry affordances based on possible (future) use, where examples of semiotic resources are artefacts, materials and actions used for communication (van Leeuwen, 2004). Semiotic resources for speech include lexis, syntax, pitch, intonation, duration, salience, intensity, vocal quality; semiotic resources for gaze, include direction and duration, and for gesture there is position, movements of face and body; semiotic resources for writing, include grammar, syntax, typeface, layout, colour, and for image, colour, saturation, positioning of elements, proximity, distance, et cetera. Writing is a mode, while typeface is a semiotic resource (Bezemer & Kress, 2016). When the term writing is used in this study it refers to the mode writing.

When making meaning people produce signs in different semiotic modes, using different representational resources within specific contexts/discourses (Halliday, 1978; Kress & van Leeuwen, 1996/2006), where a sign is a form that carries meaning and interest (Kress, 1997, 2010). Signs are
viewed as relatively flexible, dynamic and open systems. *Arrangements* are the ordering of signs and the forms of organisation for realisation of meaning (Kress, 2010; Kress & van Leeuwen, 2006). The concept *motivated sign* (Kress, 1993) refers to the idea that people "bring together and connect the available form that is most apt to express the meaning they want to express at a given moment" (Jewitt et al., 2016, p. 68). Behind motivation Kress identified *interest*, "the articulation and realisation of an individual’s relation to and object or event" (Kress, 1993, p. 174). Interest is a complex concept, which is framed by the individual’s past experience and in the moment. Hence, interest is shaped both individually and socially (Kress, 1997, 2010; MODE, 2012). In other words, interest refers to the condensation, in the moment, of every experience, which has shaped the subjectivity of the sign maker; the concept of sign-maker refers to both the person making a sign, and the person interpreting a sign, where the activity of interpreting is seen as re-making a sign (Jewitt et al., 2016). Within the social and the cultural context people use and combine signs, in the form best suited to the meaning they want to communicate, and the resulting text becomes a window into the person communicating (Jewitt 2014c; Kress, 1998). A text is a complete whole. It is a "multimodal semiotic entity" (Kress, 2010, p.148), which has subtextual units, or modules, and where the minimal unit of semiosis is a sign. Another facet of texts, which this study takes into account in transcriptions and analyses, is what Genette (1997) calls paratext. The concept *paratext* refers to parts of a text that accompany, surround, and extend the main text, such as titles, subtitles, illustrations et cetera. The paratext has a threshold function for the reader. It should be noted that paratext empirically is "made up of a heterogeneous groups of practices and discourses of all kinds and dating from all periods” (Genette, 1997, p. 2). *Framing* is another important concept in multimodality and "constitutes a momentary punctuation of semiosis” (Kress, 2010, p. 121). The concept framing refers to the principle(s) in any semiotic resource, or case of communication, which give internal coherence and that delimits parts of a ‘text’ or semiotic entity. Framing establishes boundaries between elements in different ways depending on the materiality of the semiotic resource, as modes come with distinct sets of framing devices most apt for that particular mode (Kress, 2010; MODE, 2012; van Leeuwen, 2004), for example a full stop marks the end of a written sentence, a pause the end of a spoken utterance, and a visual border delimits an image from the surrounding space.

*Transduction* is a cornerstone in multimodal social semiotics (Kress, 2010, 2017; Poulsen, 2017), where the concepts of translation and transformation are related to transduction. Transduction (Kress, 1998, 2003, 2010, 2017), occurs when meaning or a message is transferred between (different) modes and media (Bezemer & Kress, 2008; Bezemer & Mavers, 2011), and is the process of translating meaning from one sign system to another (Culache, 2015; Kress, 2010, 2017; Poulsen, 2017) where both the original and the new re-made representations have their unique communicative affordances and meaning potential (Smith et al., 2016). Translation is "the process of moving meaning” (Kress, 2010, p. 124) and "transduction (the remaking of meaning across modes) and transformation (meaning remade within the same mode)” (Poulsen, 2017, p. 37). To be more precise, when constructing multimodal text people engage in transduction (Kress, 1998, 2003, 2017), which is defined as a process where "signs made with the signifier material of the original mode are re-made - re-materialised - in the distinct and different signifier material of the target mode” (Kress, 2017, p 44).

### 2.3 Knowledge and representation

*Knowledge* can be understood and studied in different ways depending on underlying theoretical frameworks, which carry different assumptions about how knowledge is formed. Different theoretical
frameworks also affect our understanding of how knowledge becomes visible. While not the focus in this study, learning should nevertheless be mentioned, and can be seen either as an individual or social phenomenon. In perspective used for this study knowledge and learning are seen as mutually interdependent concepts, where knowledge is made visible in (material) representations, and learning is viewed as interaction (Kress, 2010; Kress & van Leeuwen, 2006; Selander & Kress, 2010). Kress (2010) points out that the term learning is not one which belongs in social semiotics, but also emphasises that no learning can take place if there is no meaning being made (Kress, 2010, p. 178). According to Selander and Kress (2010) meaning making is a creative action in which an individual reshapes earlier representations of knowledge, where representations of knowledge are seen as signs of learning. Selander and Kress (2010) describe learning as transformation in learning sequences. The basic learning sequence is described as a cycle of transformation where the starting point is a combination of available resources together with the norms framing the task (Selander & Kress, 2010, p. 34). The student transforms his or her interpretation of the assignment, and available information into his/her own representation of knowledge. This learning sequence is made up of two transformation cycles; in the first cycle knowledge is transformed and in the second cycle knowledge is re-presented (Selander & Kress, 2010). This study places the analytical focus between the first and second transformation cycles, where the re-presentation or re-shaping of knowledge is taking place; a key point is to illuminate how students re-present knowledge in written and audiovisual texts, where knowledge and text are viewed as completely linked (Kress, 2010; Selander & Kress, 2010); "knowledge as such comes into being in the form of some material entity, a text" (Kress, 2010, p. 23). When making representations of knowledge, such as essays and audiovisual presentations, students are working in learning sequences, but the focus in this study is placed on the representations of knowledge rather than the learning processes behind the material representations of knowledge the students have produced. When students are making meaning and producing representations of knowledge they do so in a double context. They are working in a school context, but there is also the larger context of the contemporary media landscape where Kress (2010) identifies three characteristic and salient features; "(a) Forms of knowledge production: (b) Forms and principles of text-making composition; and (c) Social and semiotic blurring; the dissolution, abolition, disappearance of frames and boundaries” (Kress, 2010, p. 23). In multimodal social semiotics and in this study, meaning making is central, and learning is seen as a social phenomenon in a process of (re)constructing a social reality (Bezemer & Kress, 2016), where learning is assumed to be an activity where we interpret and produce signs. This is a process of transferring information and making representations of knowledge (Selander & Kress, 2010), or in other words, a process of transduction (Kress, 1998, 2003, 2017).

2.4 Previous research

2.4.1 Method of searching

The search for previous research in educational contexts was focused on different perspectives of multimodality, social semiotics, and with a focus on knowledge and learning in digital learning environments. The search was carried out using several databases and search engines, with the search criteria, in different combinations, multimodality, social semiotics, transduction, transmediation, multimodality, education, and representation of knowledge. During the autumn of 2017 systematic searches were carried out via Stockholm University Library’s search function and the search engines EBSCO (ERIC and ProQuest), Google Scholar and LIBRIS (the Swedish national search tool). Avhandlingar.se and academia.edu were searched for theses and dissertations. International and
Swedish research journals and publications, within the field of education and pedagogy, were searched for relevant studies where articles should have been peer-reviewed and published between 2007 and 2017. Titles should have been referenced multiple times, with the exception of the most recent theses or books (from 2017). The search for literature generated suggestions for related titles and topics, and some of these titles were included in the reading even though published before 2007. Texts were screened in several stages. The starting point for the reading was abstracts or summaries. Relevant texts (articles, theses) referred to other relevant texts in the field, which were then added to the reading list. Only articles written in English were included while theses in both English and Swedish were included.

2.4.2 Digital learning environments and language learning

There is no shortage of previous research relevant for the area of digital representations of knowledge made in a digital learning environment. Learning environments where students use laptops are becoming more and more common in the Western world (Valiente, 2010). A decade ago the study of Dunleavy et al. (2007) showed that the most common use for digital tools (computers) in US schools was searching for information, exercises or communication. In Sweden, Tallvid (2015) studied the effects of digitalisation in two lower secondary schools (2007-2011) and four upper secondary schools (2012-2014) and showed that classroom activity appeared largely unaffected by the introduction of digital learning environments, where every student and teacher had a laptop or tablet for their personal use. Tallvid’s (2015) study also showed that digital environments affected teacher planning and that the students’ use of digital tools changed over time. Åkerfeldt (2014) studied school practices, digital resources and didactic design. Her dissertation comprises three empirical studies, which were conducted within Swedish school practices with a multimodal and design oriented perspective on learning. Åkerfeldt (2014) examined ”how digital resources shape and create conditions for learning as well as which resources are made available to pupils and how these resources in turn shape the pupils’ ability to represent their knowledge” (Åkerfeldt, 2014, p. 101). The third study (Svärdemo Åberg, Åkerfeldt & Selander, 2013) examined ”writing, meaning making and learning” (Åkerfeldt, 2014, p. 103) focusing on written and oral representations of knowledge. Results showed that digital writing technologies have an impact on students’ writing processes, which is in line with previous research, and that media and modes used for learning shape communication and delimit the reach of what knowledge can be represented in a certain situation (Jewitt, 2009; Kress, 2003; Selander & Kress, 2010). Ranker’s (2015) article “The Affordances of Blogs and Digital Video” presents two US ninth grade students’ literacy processes and the use of multiple media in teaching and learning. The study used a multimodal focus, with reference to Gibson, (1979), Kress (2003), Norman (1988) and van Leeuwen (2005), to examine how the different digital media offered both affordances and constraints when the students studied their subject. Ranker used the concept affordance to examine how ”each medium or technology, such as the Internet or digital video, provides users with distinct ways of reading, writing, and using various combinations of modes” (Ranker, 2015, p. 569). Ranker’s aim is to describe the two boys’ work with blogs and video. The article is anchored in research on digital tools and media in literacy and education and multimodality. Ranker’s results showed that the blogs afforded the students means to examine their chosen subject in depth and through the use of writing. The video part of the project afforded visual modes and speech. In their blog the boys could create a synthesis of the texts they had read on the subject and the video, the visual medium of the video made it easier to represent relations between ideas and objects (Ranker, 2015).

Swedish students learn English for purposes of communication, where “students should be given the opportunity, through the use of language in functional and meaningful contexts, to develop all-round
communicative skills” (Swedish National Agency for Education, 2012, p. 1), but verbal language is not the only means for communication. Language is only one of many communicative resources, and the view that all communication is multimodal is one of the key tenets in multimodality (Early, Kendrick & Potts, 2015; Jewitt 2014b; Kress & van Leeuwen, 2001). Early educational research in the field of multimodality reimagined literacy education (The New London Group, 1996). Since then, there have been many studies in educational contexts using multimodal frameworks. Among studies focused on transformations of text and practice we find Kress et al. (2005) and their study English in urban classrooms: A multimodal perspective on teaching and learning. A more recent study is Jewitt’s (2011), where she studied, in a British classroom, changing teaching and learning in the subject English, from a multimodal perspective. Jewitt (2011) identified four trends, reconfiguration of resources of communication and representation and shapes of knowledge, weakening or fluid boundaries between specialised and everyday knowledge, changing and intermixing of roles between users and producers of knowledge and modularisation of knowledge into chunks (Jewitt, 2011, p. 186). Among studies found in the intersection of multimodality and language education for non-native speakers of English there is Mestre-Mestre (2015) who studied how meaning is made by university students of English as a second language, using Multimodal Discourse Analysis. Mestre-Mestre’s (2015) study looked at interaction between images and their role in meaning making, and how students mix text and image when communicating. The students were using English as a second language at proficiency levels where the students were able to communicate but were "far from proficient in the second language” (Mestre-Mestre, 2015, p. 233). The results showed that textual and visual modes complement each other. "Images are crucial in oral communication. However, the relationships established between images and texts show that texts are crucial to support speech” (Mestre-Mestre, 2015, p. 233). Students relied more on images as the concepts increased in level of abstraction, but the students used different strategies for combining writing and images when making meaning after what type of concept they wished to communicate (Mestre-Mestre, 2015, p. 233). Hafner (2014) looked at undergraduate university students in Hong Kong, who were using English as a second or foreign language, and where their science course included elements of digital literacy. The students reported in written text and in the format of film. Hafner’s (2014) study combines analysis of multimodal texts with a focus on the cultural understanding needed to understand the student’s choices of semiotic resources. In the study Hafner (2014) uses a multimodal framework (Kress 2000, 2003, 2010; Kress & Jewitt, 2003; Kress & van Leeuwen 2006; the New London Group, 1996) and combines analysis of text, which is using writing and moving images, with questions about the cultural understanding needed to make sense of the students semiotic choices, concluding that there is tension between academic practices of writing and the creative process of multimodal text production, where the students "must make choices about combination of modes, such as text on the screen, oral narration, image, sound, and gesture” (Hafner, 2014, p. 644)

2.4.3 Transduction and comparative methods

Previous studies on transduction include Höglund (2017), Smith et al. (2016), Whitin (2005), McCormick (2011) and Birdsell and Groarke (2007). Höglund (2017) studied transduction processes in multimodal designing for a group of Finnish students in lower secondary school. More specifically how the students used "digital videomaking in response to a poetic text” and how the transduction process influenced their work with interpreting poetry (Höglund, 2017, p. iii). The theoretical framework used by Höglund (2017) is "grounded in a performative approach to literary interpretation” (Höglund, 2017, iii) and uses social semiotic and multimodal theory. The aim of the study was to contribute to "the larger conversation about the rationale for reading and teaching of literature – the
legitimisation of literature education” (Höglund, 2017, p. 17). Höglund (2017) studied and analysed the process of students’ collective work as well as their representations of knowledge (videos), focusing on how the students make meaning both in their end product, the video, but also of how they make meaning in their multimodal design processes. The results illustrate that the process of multimodal design (in response to literature) is complex and offers a large potential for negotiating literature in the transduction process from poetry to video. Höglund’s analysis suggests that the semiotic resources used can be a key component when students work with interpreting literary texts; in the transduction process the abundance of semiotic resources available were both a challenge and an asset, both of which ”offer and accommodate spaces for negotiations” (Höglund, 2017, p. iv). Hence the results of Höglund’s study show that ”negotiating interpretation encompasses ways of combining, juxtaposing, and emphasising different interpretations” (Höglund, 2017, p. iv). Smith et al. (2016) examined university student’s transduction of argumentation across written text and digital videos. Studies on transduction in school settings, have mostly, according to Smith et al. (2016) focused on transduction and reinterpreting literature (McCormick, 2011; Smagorinsky, 1997; Whitin, 2005) with emphasis on how transduction helps develop abstract thinking and critical skills. Whitin (2005) studied how students generated multi-layered interpretations of the content, and McCormick (2011) showed how students achieved new understanding of how a text is organised rhetorically. Birdsell and Groarke (2007) showed that images can be used rhetorically to play on emotions, or position the reader with the point of view of the author.

Smith et al. (2016) used a comparative analysis with social semiotic and multimodal theoretical frameworks (Halliday, 1978; Hodge & Kress, 1988; Jewitt, 2009; Kress, 2010; van Leeuwen, 2005). The content in both written essays and digital videos, and development of transduction visualisations was analysed, and a multimodal analysis of ”communicative affordances and constrains for argumentation with each medium” (Smith et al., 2016, p. 138). The authors conducted a similar content analysis to clarify how students build arguments in the videos, using multimodal transcripts (Flewitt, Hampel, Hauck, & Lancaster, 2009) and the kineikonic mode (Burn & Parker, 2001) as anchor mode (Flewitt, Hampel, Hauck, & Lancaster, 2009; Nelson, Hull, & Roche-Smith, 2008; Smith et al., 2016, p. 142). Results showed that supportive argumentation was the most common type of content in both essays and videos, and that videos lacked counter argumentation; different amount of ideas were transformed in different way in the transduction processes and both essay and video ”offered unique affordances for building an argument based on their modes of communication” (Smith et al., 2016, p. 138). Smith et al. (2016) is the previous study that has provided most inspiration for comparative methods and categorisations, in that Smith et al. (2016) used their comparative method and transduction visualisation to make clear how ideas transformed from essays to video (Smith et al., 2016, p. 138); Kress contributed with inspiration for the general top-down approach where ”the direction of analysis and description, of definition and constitution of both the text and the subtextual units is ’top-down’” (Kress, 2010, p. 148).

2.4.4 Theory and previous research in relation to this study

This study shares with all mentioned previous studies and works the view of knowledge and learning as context dependent and socially constructed. The process of transduction is a key element in this study; previous studies that share the focus of transduction are Smith et al. (2016) and Höglund (2017). Åkerfeldt (2014) has a design oriented perspective, but shares with this study an interest in studying representations of knowledge and a concern with transduction processes. Åkerfeldt used video recordings, while here data is retrieved from a Learning Management System. The research interest in Höglund’s (2017) study can be placed within the field(s) of meaning making and
multimodal design, but Höglund’s focus is literature education (lower secondary school and education in the native language in Finland), while here it is Swedish ESF/ESL upper secondary students’ texts, with a historical-political content. Another difference between this study and Höglund’s (2017) is the produced data. Höglund has designed her study with the intent for students to work with transduction processes. This study uses empirical material, which has not been produced with the intent of research purposes, but that is the product of the regular scope of teaching. Ranker’s (2015) article “The Affordances of Blogs and Digital Video” has parallels to this study in how it examines affordances and constraints in written and visual modes and media although there is no element of looking at transduction processes in Ranker (2014). Studies that focus on transformation of text have in common with this study the core interest of changing text practices in increasingly digital landscapes of education. Although Mestre-Mestre (2015) uses multimodal discourse analysis, which this study does not. Mestre-Mestre’s (2015) study is interesting in the examination of meaning made by non-native speakers of English, as are the students in this study. Hafner (2014) studied non-native speakers meaning making across written text and film and becomes relevant both for the study of non-native speakers and for the dual representations of knowledge. Höglund (2017) and Smith et al. (2016) more specifically examine transduction, and in their focus and construction come closest to this study. The study of Smith et al. (2016) is a comparative study using a multimodal framework for examining transduction in written essays and multimodal digital videos, which is close to the object of this study. However, the study of Smith et al. (2016) is situated within higher education and not secondary education; they “examined how argumentation was constructed in each medium, travelled across them, and the unique communicative affordances offered by each medium” (Smith et al., 2016, p. 139). The object of this study is to examine how knowledge and meaning, rather than argumentation is re-made across digital essays and audiovisual presentations. Argumentation is here seen as one facet of representing knowledge although not the focus in this study. Smith et al. (2016), have parallels to this study with transduction and the multimodal social semiotic and comparative framework.

This study hopes to add knowledge on how Swedish upper secondary students work with *transduction* across written and audiovisual modes and media. Contrary to other studies there is no presupposed order of work. The students are not necessarily carrying out a transduction process from a written medium to visual one. They are just as likely to work in the other direction. Smith et al. (2016) compares written and audiovisual artefacts for university students with a specific focus on argumentation. The students in this study are younger and the focus in the students’ work is not primarily argumentation although there are elements of argumentation in their work. Another difference is that in this study the data is retrieved retrospectively from a Learning Management System, and the students are working with digital presentation programs rather than video. Most studies within the field of education, multimodality and transduction, are found within literacy studies but is not where this study is situated. There seems to be few, even a dearth of, comparative studies of (secondary) students’ work with producing both written text and audiovisual text. This study builds on earlier work in multimodal social semiotics based in literacy and transduction, and adapts comparative methods and transcriptions to be able to visualise and study six students’ (parallel) representation of knowledge across modes and media.
Chapter 3 Method

3.1 Concepts and methodological tools

In this study the multimodal social semiotic perspective (Bezemer & Kress, 2016; Halliday, 1978; Jewitt, 2014b, 2014c; Jewitt et al., 2016; Kress, 2010, 2017; Kress & van Leeuwen 2001, 1996/2006; Selander & Kress, 2010) has afforded tools for understanding how meaning is made and represented with different media (essays and audiovisual presentations). The different types of data, essays and audiovisual presentations, made it possible to analyse how meaning was made, and how knowledge was moved and re-shaped across different media. The multimodal social semiotic framework was chosen because it made it possible to examine and seek understanding of how students make meaning using a variety of modes. A multimodal social semiotic framework was apt for the purpose of studying students’ representations of knowledge as modes are not set or fixed but everyday instantiations of communication, meaning making and knowledge (Kress, 2010) and the production of representations of knowledge in a school context is an everyday occurrence. To better understand the students’ meaning making situated in a digital learning environment the multimodal social semiotic perspective was useful as it is a perspective that is used to identity and closely examine semiotic choices and representations used in multimodal communication (Kress, 2010; MODE, 2012). The multimodal social semiotic perspective was therefore apt for studying how students’ shape knowledge and make meaning in both written and audiovisual text and for interpreting those same texts.

The term transduction (Kress, 2010, 2017; Poulsen, 2017) was used as the conceptual tool for understanding the process of moving and re-making meaning across written and audiovisual text, where the methodological focus was placed on how the students made meaning in two different media. The correctness of English usage or historical facts were not considered in the study. The assignment (appendix 2) the students had worked with should be seen as one unit that was reported both in writing and speech, and where framing and structure were equivalent for the production of both essay and audiovisual presentation. A reason for using transduction as a conceptual tool, and the reason why transduction is studied here, is that there is an ontological and epistemological change taking place in the process of transduction (Kress, 2017). By studying transduction it became possible to discern layers of meaning that otherwise would have been difficult to reveal, and to catch sight of changes at epistemological and ontological levels. The essays and audiovisual presentations were here seen as material instantiations of the ideational, interpersonal and textual metafunctions (Jewitt, 2014c). These metafunctions (Halliday, 1978; Kress & van Leeuwen, 1996/2006) have been core concepts in this study and were used for analyses. This study has assumed the expanded use of the concepts of the ideational, interpersonal and textual metafunctions to include the visual, as defined by Kress and van Leeuwen (1996/2006) and following work (Jewitt, 2014c; Kress et al., 2001, 2004; Kress & van Leeuwen 2001; Kress 2003, 2010; van Leeuwen 1999, 2005). The metafunctions were used to answer the first research question; how do students make meaning and represent knowledge about civil rights in the English speaking world in their written essays and in audiovisual presentation. In this process modes were examined, where modes are seen as the products of people (as social agents) who shape something 'material' into meaning, into cultural semiotic resources (Björkvall & Karlsson, 2011; Kress & van Leeuwen, 2001). To answer the second research question, what are the affordances of
written essays compared to audiovisual presentations for representing knowledge about civil rights, the concept modal affordance was central, while transduction was the conceptual tool for answering the third research question; how can the students’ text production be understood in terms of transduction.

3.2 Research design

Methodologically the focus in this study was placed on how the students, using different modes after their affordances, made meaning, and shaped knowledge, in the different media of essay and audiovisual presentation when making dual representations of the same content area of knowledge. The method has followed a top-down path of analysis (Kress, 2010). The layout and work order of the study is illustrated in figure 1, which should be read from top to bottom. There are no lines to mark reading order, which is intentional. Written text is placed to the left in the figure, but is given no precedence or dominance over audiovisual text. However, for practical reasons when processing data, transcriptions started with the written texts, and just as we read from left to right in the Western reading order so does the figure’s layout illustrate the work order in the study.

Figure 1. Layout of the study. An illustration of the construction of the study; empirical material, meaning making, affordances and constraints, and transduction across written and audiovisual text.

3.2.1 Selection and delimitation

Students from two classes that started upper secondary school in August 2014, were selected for participation in the study. Students in the A14 class studied a program preparatory for higher education, the Natural Science Programme (Swedish National Agency for Education, 2017b). Students in the B14 class, studied a vocational program, the Natural Resource Use Programme (Swedish National Agency for Education, 2017a), but with an academic ‘twist’ where the students had the
option, but not the requirement, to study a full academic science profile supplementing their vocational program. Both groups studied English for two consecutive years with the same course plan, where one single themed unit of work was selected for this study (appendix 2). This unit was chosen because the students were required to report on the same topic both in writing and in speech (using images). The dual representations of knowledge allowed for studying transduction across written and audiovisual modes. Another reason was that both groups of students had worked with the themed unit, using the same instructions and with the same time frames, making the instructional context comparable. Only students who had handed in digital multimodal audiovisual texts with recorded speech, were included in the study, which limited the number of students to six, and the data for analysis to twelve (written or audiovisual) texts.

3.2.2 Context and produced data

The school is a publicly funded upper secondary school in a rural part of Sweden, which offers both vocational programs and programs that prepare for higher studies. The school had about 400 students each year during 2014 to 2016. It should be noted that all the students in the study had been my students and taught by me. However, the students were asked to take part in the study after having completed their studies of the course English 6 (Swedish National Agency for Education, 2012). The students included all agreed to participate and to allow the retrospective retrieval of their work, in the form of digital material, from the school’s Learning Management System. When the students consented to take part in the study they were all over eighteen. The students have been de-identified and have here been called Ada, Camilla, Daniel, Emma, Fanny and Greta. A seventh student, Bessie, who had reported in the form of film was excluded from the material after the work with transcription, description and analysis had been commenced. The main reason for this was to keep the audiovisual presentations analysed within the same format.

The themed unit "Civil Rights in the English Speaking World” (appendix 2) had been a recurring part in the course English 6 (The Swedish National Agency for Education, 2017c) at the school. The instructional unit was designed, some years prior to this study, by me in collaboration with colleagues, to conform to the national course requirements, where the core content and content of communication in the course should include "living conditions, attitudes, values, traditions, social issues as well as cultural, historical, political and cultural conditions in different contexts and parts of the world where English is used” (The Swedish National Agency for Education, 2017c). These national requirements in turn have been constructed to conform to the Common European Framework for Languages (Council of Europe, 2011), which describes among other things what students "have to learn to do in order to use a language for communication . . . . The description also covers the cultural context in which language is set” (Council of Europe, 2011). The instructions for the themed unit (appendix 2) required the students to research an area related to civil rights in the English speaking world, today or in the past. The students wrote an essay, and made an audiovisual presentation, where they should include background and information, a comparison to their own country, and their own thoughts on the issue. The students used the presentation program Keynotes, which comes with several templates for design and layout. In the instructions there was a general writing instruction included for how to structure an essay, and a general instruction for oral presentations. A list of sources was a requirement for all students, but some students chose to hand in a separate document with their sources, which was accepted. The students were free to choose how to deliver their oral presentations, live or as a recorded digital presentation, where the recorded digital presentations have been selected for this study. As the work was reported both in writing and speech, the students made dual knowledge representations of the same content. Note that no order was specified for the essay in relation to the oral presentation,
which means that the students could choose to write the essay first, and then do the oral presentation, or the other way around. Both essay and oral presentation were due to be handed in at the same time in the learning management system. Hence, there is no way of knowing the order in which the students have worked. What is possible to know, as it is stated in the instruction, is that the students were required to research their topic and that the information they gathered should be used for both essay and oral presentation.

The *essays* were written on a computer using word processing programs and the audiovisual presentations were made using a digital presentation program featuring embedded design elements, and that allowed for the use of images and for recording voice. The six students all chose to record their presentations and to focus on some area of civil rights in relation to black or indigenous populations. The *audiovisual presentations* varied in logic, shape and realisation. The common denominators were the topics, relating to civil rights in the English speaking world, and the three parts of the assignment, background information, a comparison to Swedish issues concerning civil rights, and the student’s own reflections. The six students used Keynotes, a digital presentation program with still images, writing and which allowed for recording voice. All students had titles for their essays and presentations. Some of the students also included subheadings, a lead and/or bullet points in their essays and in one case an image. One of the students handed in a list of sources in a separate document. The scope of the essays and audiovisual presentations varied. In the audiovisual presentations there were differences in the use of colour, both for backgrounds and in illustrations and written text elements, and the number of slides varied from one to seven. The audiovisual presentations used animations of text elements and transitions in different ways. The use of illustrations also showed signifying differences in the use of documentary photographs, paintings and drawings, and maps of different kinds. All students included spoken narration in their audiovisual presentation but the extent of written text used varied. Four students chose to focus on black civil rights in the USA and two on civil rights for indigenous people in Australia. Signifying differences in how students chose to represent their knowledge in their essays and audiovisual presentations are shown in table 1.

**Table 1. Students, essays, audiovisual presentations and signifying differences.** (* no of words excluding paratext).**

<table>
<thead>
<tr>
<th>Artefacts</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Essay</strong></td>
<td>Ada         Camilla         Daniel       Emma       Fanny       Greta</td>
</tr>
<tr>
<td><strong>Heading</strong></td>
<td>Black civil rights Civil rights Black people’s civil rights in America Black civil rights The Stolen Generations of Australia Australia’s stolen generation</td>
</tr>
<tr>
<td>Subheading</td>
<td>Martin Luther King Jr., Rosa Parks, Sweden vs the US</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Lead</td>
<td>-</td>
</tr>
<tr>
<td>Bullet points</td>
<td>yes</td>
</tr>
<tr>
<td>Illustration</td>
<td>-</td>
</tr>
<tr>
<td>No of words*</td>
<td>569</td>
</tr>
<tr>
<td></td>
<td>1430</td>
</tr>
<tr>
<td>2. Audiovisual Presentation</td>
<td>Ada</td>
</tr>
<tr>
<td>Title</td>
<td>Black civil Rights</td>
</tr>
<tr>
<td></td>
<td>THE STOLEN GENERATIONS OF AUSTRALIA</td>
</tr>
<tr>
<td>Background colour</td>
<td>black</td>
</tr>
<tr>
<td></td>
<td>green</td>
</tr>
<tr>
<td>Writing/text colour</td>
<td>white</td>
</tr>
<tr>
<td></td>
<td>black, 2 reds</td>
</tr>
<tr>
<td>No of slides</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Animations</td>
<td>-</td>
</tr>
<tr>
<td>Still images</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Duration</td>
<td>2:12</td>
</tr>
<tr>
<td></td>
<td>4:07</td>
</tr>
<tr>
<td>Country</td>
<td>USA</td>
</tr>
<tr>
<td></td>
<td>USA</td>
</tr>
</tbody>
</table>
3.3 Processing the data

Material arrangements in semiotic objects (texts), where inner unmaterialised meaning is given outward form, is where, and how, the student’s meaning making becomes visible (Kress, 2010). Models for working with close reading of multimodal texts (Bezemer & Kress, 2016; Kress, 2010; Kress & van Leeuwen, 1996/2006; Machin & Mayer, 2012) were useful in the process of unwrapping text to illuminate how different modes are used and their affordances. The close reading started with overall structure and realisation of the texts, looking at how different parts of the text work together, considering proximity and congruency between visual modes and verbal modes. In order to compare the content, meaning making and transduction in and between the essays and the audiovisual presentation, a similar analysis of written texts and audiovisual texts was conducted, where a common framework both for written and audiovisual text was needed as a tool for comparative analysis, both for transcription matrices, and for categorisation. To achieve this, multimodal transcripts were created separately for each of the audiovisual presentations and the essays, starting with adapting ideas for transcriptions from Flewitt, Hampel, Hauck, and Lancaster (2014), and the MODE transcription bank (University College London Institute of Education, 2012) striving to create transcriptions that did justice to the intended research and collected data. In this Flewitt et al. (2014) provided a starting point for units of analysis, such as time and visual frames, and ideas for how to present data using transcription matrices. The term transcription is most often used in referring to "the process of turning audio-recorded data into examinable written text" (Flewitt et al, 2014, p. 50), but here the use of transcriptions was expanded and adapted to include the written medium in the form of essays, which were transferred (transcribed) to matrices constructed to enable comparative analyses of written and audiovisual texts (figures 2, 3 and 4).

Smith et al.’s (2016) study was used as inspiration and a starting point for creating descriptive categories, across written and audiovisual representations of knowledge, which could be used for comparative analyses. Out of the categories used by Smith et al. (2016), it was ‘descriptions’ and ‘building relations to the reader’ (p. 142) that turned out to be useful and applicable to the empirical material in this study. After several adjustments, and rethinking both scope of the thesis and categorisations, descriptive categories for this thesis were finally divided into information (including explanations and exemplifying), relating to the reader (including arguments and opinions) and textual devices (including linking and paratext) (figure 9). Categorisation was applied to subunits of text labelled idea units. The concept idea unit was borrowed from Smith et al. (2016) and Mayer (1981, 1985). The subunits of text used by Smith et al. (2016), going back to Mayer (1981, 1985), were adapted and adjusted further, also using ideas from Kress (2010), for dividing the students’ texts (table 2). Kress writes about subtextual entities as “units which serve to make up texts and other semiotic entities” (2010, p. 147). Here the term idea unit is used for such subtextual units (Kress uses other terminology but the purpose is the same). Kress defines text as the largest semiotic entity, which is made up of subtextual units where these are “derived from their functions and uses within the text” (Kress, 2010, p. 148). Mayer (1981, 1985) together with Smith et al. (2016) was used for the delimitation of idea units. Dividing the written and audiovisual texts into episodes and idea units helped in the fined grained comparative analyses. The use of idea units made it possible to compare content, how meaning was made and transduced across written and audiovisual texts at a microlevel. Episodes made it possible to compare sequences of text that were one logical unit (such as paragraphs in written text) that supplied a comparative framework. The use of episodes and idea units made it
possible to analyse sequentiality and organisation, including cohesion and coherence in the written and audiovisual texts, and then how these were transduced.

Table 2. Logic for dividing texts into subunits for categorisation. Modelled after Kress (2010) and Smith et al. (2016).

<table>
<thead>
<tr>
<th>Level</th>
<th>Text</th>
<th>Episode</th>
<th>Idea Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Text</td>
<td>Complete whole</td>
<td>rests on features of cohesion and coherence</td>
</tr>
<tr>
<td>2</td>
<td>Episode</td>
<td>Constitutive part of a text</td>
<td>Experienced as a unit and meaningful at the level it occupies in the text</td>
</tr>
<tr>
<td>3</td>
<td>Idea unit</td>
<td>Units which make up texts</td>
<td>Sequence that expresses action, event or state</td>
</tr>
</tbody>
</table>

Multiple transcriptions were constructed and adjusted in a continuous and ongoing process. The different stages of processing the essays and audiovisual presentations, including different types of selections and delimitations, were all part of a process of analysis. It was not possible to separate the process of transcription from the process of analysis, and data should in this study be seen as produced rather than collected. Table 3 illustrates the data produced and processed in two stages, where the second stage of produced data are the transcriptions created and used for analysis of transduction processes.

Table 3. Data and processing.

<table>
<thead>
<tr>
<th>Produced data (stage 1)</th>
<th>Processing the data (stage 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essays</td>
<td>Segmented line by line and moved to a transcription matrix. Divided into episodes and idea units, categorised and analysed after metafunctions, in detail.</td>
</tr>
<tr>
<td>Audiovisual presentations</td>
<td>Segmented second by second, and transcribed onto a transcription matrix, divided into episodes and idea units, categorised and analysed after metafunctions in detail.</td>
</tr>
</tbody>
</table>
### Produced data (stage 2)  | Processing the data (stage 2)
---|---
**Visualisation (of transduction) matrices** | Columns for episodes and idea units from transcriptions of essays and audiovisual (Keynote) presentations were transferred onto a third matrix for comparison and parallel visualisation (a second stage of transcription) and analysed closely.

**Visualisation of intensity (of transduction) matrices** | The same matrix as for the first level of transduction analysis (above) was used for visualising intensity of transduced themes (or concepts)

Transcriptions in this study were not only used for representing speech in writing. Transcriptions were also used to make it possible to study meaning making, with attention to detail, as a basis for analysis. The multimodal transcriptions were produced to enable the study of content and ideas realised in different representations. The transcriptions strived to take heed of temporality and how orchestration, or composition, of modes convey a certain meaning. They were constructed to make it possible to reveal how modes are arranged in certain ways after the communicative interest of the student and how the modes are set in a communicative frame where different modes 'do' different things (Bezemer & Kress, 2016; Kress, 2010). The transcriptions were also constructed to clarify layout, (how things are placed in space in meaningful ways), ordering and visual balance (left right, top bottom). Coherence and cohesion were made visible in the transcripts, through the consistent use of colour and positioning (Bezemer & Mavers, 2011; Bezemer & Kress, 2016). The same colour codes have been used in figures, as well as transcriptions and analyses, to create visual cohesion between all methodological levels in this study. (When colour has been used for other purposes besides the above indicated categories other shades have been chosen). To this end transcriptions were carried out in several steps with increasing complexity in both transcripts and categorisations (Flewitt et al., 2014) using a top-to-bottom approach (Kress, 2010). Essays and audiovisual presentations were read and viewed many times. The work with Ada’s and Daniel’s essays and audiovisual presentations was kept ahead in the process of description and analysis for constructing and adjusting categories, matrices, layouts and forms for transcriptions and comparisons.

Matrices with lines and columns (Flewitt et al., 2014) were created for both essays and audiovisual presentations. First the essays were transcribed, and numbered line by line, onto a transcription matrix for analysis (figure 2). The transcription matrices were constructed with columns for categories added from left to right following the Western reading order. Columns for the descriptive categories, episode and idea unit, were then added. After the essay had been transferred line by line onto a transcription matrix a first segmentation into episodes (Smith et al., 2016) was carried out, where boundaries for episodes were set after paragraphs or sharp shifts (transitions) in content. Episodes were identified after these boundaries and labelled and numbered. Then idea units (Mayer, 1981, 1985; Smith et al., 2016) were identified. Idea units were here defined as subtextual units (Kress, 2010) within each episode, where an “idea unit expresses one action or event or state and generally corresponds to a single verb clause” (Mayer, 1981, p.12), but could also be identified and divided after location or time
or textual function (such as linking comments). Hence "each idea unit consists of a predicate - either a verbal or a location or a time marker" (Mayer 1981, p. 12).

<table>
<thead>
<tr>
<th>Line no</th>
<th>Text</th>
<th>Episode</th>
<th>EU in text</th>
<th>EU no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black civil rights</td>
<td>Black civil rights</td>
<td>A.I.U. 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>In 1964 the congress accepted the Civil rights act, which forbade discrimination based on race,</td>
<td>In 1964 the congress accepted the Civil rights act</td>
<td>A.I.U. 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>based on race,</td>
<td>forbade discrimination</td>
<td>A.I.U. 3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>To also forbad segregation in public places, meaning that you can't say that</td>
<td>To also forbad segregation in public places,</td>
<td>A.I.U. 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>meaning that</td>
<td>meaning that</td>
<td>A.I.U. 5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>This is only for white people or only white people can be in here. And followed by the civil rights laws</td>
<td>Only white people can be in here</td>
<td>A.I.U. 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>followed by the civil rights act 1965</td>
<td>followed by the civil rights act 1965</td>
<td>A.I.U. 7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>In 1965 black people were allowed to vote. Jim Crow laws were a form of legislation in USA</td>
<td>Jim Crow laws were a form of legislation</td>
<td>A.I.U. 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>in USA between 1876 and 1965.</td>
<td>A.I.U. 9</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Between 1876 and 1965. Saying that you should not mix black with whites. The laws were</td>
<td>Saying that</td>
<td>A.I.U. 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>you should not mix black with whites</td>
<td>The laws were</td>
<td>A.I.U. 11</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Discontinued when the Civil rights act and blacks right to vote.</td>
<td>when the Civil rights act and blacks right to vote.</td>
<td>A.I.U. 12</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Example of format for transcription of essays. This is a section from the transcript of Ada’s essay.

<table>
<thead>
<tr>
<th>Time duration</th>
<th>Speech</th>
<th>Text</th>
<th>Image</th>
<th>Episode</th>
<th>EU description</th>
<th>EU no_s</th>
<th>EU description</th>
<th>EU no_w</th>
<th>EU description</th>
<th>EU no_i</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:07</td>
<td>Civil rights</td>
<td>Black civil rights</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.01</td>
<td>Presentation is going to</td>
<td>presentation is going to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.02</td>
<td>equal rights for all!</td>
<td>equal rights for all!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.03</td>
<td>TERROR Discrimination? Your Freedom now?</td>
<td>TERROR Discrimination? Your Freedom now?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.04</td>
<td>Civil rights today</td>
<td>Civil rights today</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.05</td>
<td>and in the past in the US...</td>
<td>and in the past in the US...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.06</td>
<td>Freedom now!</td>
<td>Freedom now!</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.07</td>
<td>A comparison to</td>
<td>A comparison to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.08</td>
<td>Sweden</td>
<td>Sweden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.09</td>
<td>and thoughts from me</td>
<td>and thoughts from me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
presentations, were transferred to the transcriptions matrix. The audiovisual transcript was segmented temporally, using one second as the smallest unit of duration. Columns for audiovisual modes were added. The audiovisual presentation was divided into separate slides or content sections (Flewitt et al., 2014; Smith et al., 2016) where the boundaries for episodes were set after new topics introduced (slides, text and/or image). Episodes were then identified and labelled and numbered. The second step was to identify idea units within each episode using the same basic logic for categorisation as for the essays (Mayer, 1981, 1985; Smith et al., 2016), but adjusted to encompass non-verbal modes while still expressing one action, event or state including location, or time, or organisational signals (such as transitions between slides, images or animations of written text et cetera). Just as for the essays an idea unit is part of an episode where one coherent logical idea is represented. The idea units were labelled in sequence.

After a student’s essay and audiovisual presentation had been transcribed and transferred to transcription matrices, and then segmented into episodes and idea units, a merged transcription was created (figure 4). The merged transcriptions should be read from the centre and outward, to the right and left simultaneously. In the merged transcriptions line numbers and temporal segmentation were excluded. The transcriptions were structured so that idea units in the essay and audiovisual presentation were kept parallel, always at the same level, and placed centrally in the matrix. Columns for episodes were moved to the outer borders of the transcription matrix. In this way a structure was created, which enabled the second stage of produced data, visualisations of meaning making and transduction processes.

<table>
<thead>
<tr>
<th>Episode</th>
<th>IU as Text</th>
<th>IU no.</th>
<th>IU as slide</th>
<th>IU no.s</th>
<th>IU description</th>
<th>IU no.w</th>
<th>IU description</th>
<th>IU no.i</th>
<th>IU description</th>
<th>Episode</th>
</tr>
</thead>
<tbody>
<tr>
<td>E_E1</td>
<td>Black civil rights</td>
<td>E_R11</td>
<td>E_PIU1s</td>
<td>Hello. I am going to talk about civil rights</td>
<td>E_PIU1s</td>
<td>blank</td>
<td>emerging image of black flat</td>
<td>E_PIU1s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E_E2</td>
<td>Background history</td>
<td>E_R12</td>
<td>E_PIU2s</td>
<td>in a topic I’ve chosen, black civil rights</td>
<td>E_R12w</td>
<td>BlacK Civil Rights</td>
<td>E_PIU2s</td>
<td>black flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E_E3</td>
<td>The American Civil War brought the slavery to an end in the Confederate States of America</td>
<td>E_R13</td>
<td>E_PIU3s</td>
<td>I’m gonna talk about</td>
<td>E_R13</td>
<td>BlacK Civil Rights</td>
<td>E_PIU3s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>From the 18th of December 1865 slavery was forbidden in the whole nation</td>
<td>E_R14</td>
<td>E_PIU4s</td>
<td>how the black civil rights were... in America</td>
<td>E_R14</td>
<td>BlacK Civil Rights</td>
<td>E_PIU4s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All slaves were all imprisoned free and</td>
<td>E_R15</td>
<td>E_PIU5s</td>
<td>during the twentieth century</td>
<td>E_R15</td>
<td>BlacK Civil Rights</td>
<td>E_PIU5s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the legal rights for African Americans expanded gradually</td>
<td>E_R16</td>
<td></td>
<td></td>
<td>E_R16</td>
<td>BlacK Civil Rights</td>
<td>E_PIU6s</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4. Example of merged transcription of essay and audiovisual presentation.** This is a section from the transcript of Emma’s essay vs audiovisual presentation.

Once the written and audiovisual texts had been transferred, and categorised at a first descriptive level, basic analyses were carried out. A parallel description (for each student), and first level analysis, of essay and audiovisual presentation was noted down in two columns, giving a general and simultaneous layout of both representations of knowledge, essay and audiovisual presentation (figure 5). Essays and audiovisual presentations were described and analysed sequentially and in parallel with the left
column for the written text and the mid and rightmost columns for the audiovisual text allowing for
screenshots of visual elements, clarifying layout, imagery, et cetera. At this descriptive level there was
a strive to visually segment the descriptions to keep episodes in the essay and audiovisual
presentations as parallel as possible, in such a way that the description of the first paragraph was
placed next to the description of the first slide, if ‘slide’ was the segmentation used for episodes in the
audiovisual presentation. The images the student had used were carefully described, as was layout, use
of colour and animations in the audiovisual presentations. Material arrangements were carefully
examined and described as well. The material arrangements in essays and audiovisual presentations
(semiotic objects) were where inner unmaterialised meaning was given outward form, and where the
students’ meaning making became visible (Kress 2010, p. 145). This included descriptions of framing,
how the texts were framed with temporal and spatial extension and limits, as framing devices are
signifiers. Reading order, structure and modes used were also described, where modes were seen as
central in bringing material form to meaning (Kress, 2010).

![Figure 5. Example of layout for parallel description. This is a section from the descriptions of Daniel’s essay and audiovisual presentation.](image)

To make it possible to answer the first research question, how do students make meaning and
represent knowledge about civil rights in the English speaking world in their written essays and
audiovisual presentations, the merged transcriptions (of essay and audiovisual presentation) were
marked with colour codes (figure 6) after the descriptive categories information (subdivided into
explanations and exemplifying), relating to the reader (subdivided into arguments and opinions) and
textual devices (subdivided into linking and paratext) (refer to figure 9). Each set of descriptive
category (information, relating to the reader, textual devices) was linked to the analytical categories
the metafunctions, ideational meaning, interpersonal meaning and textual meaning. In this way the
metafunctions were made visible in the transcriptions, which could then be read after colour codes in
analyses. Blue was used to code idea units where the ideational metafunction was dominant. Pink
marked idea units where the interpersonal metafunction was dominant, and turquoise shades were
used to mark idea units where the textual metafunction of communication was identified as dominant
(figure 6). Grey was used to mark an absence of information in one channel or mode of
communication. Yellow was used to mark episodes, and black to visually delimit essay from audiovisual presentation, or the end of a written or audiovisual text.

<table>
<thead>
<tr>
<th>Episode</th>
<th>U° as text</th>
<th>IU no.</th>
<th>Slide</th>
<th>U° as IU</th>
<th>IU description</th>
<th>U° as IU</th>
<th>IU description</th>
<th>U° as IU</th>
<th>IU description</th>
<th>U° as IU</th>
<th>IU description</th>
<th>U° as IU</th>
<th>IU description</th>
<th>U° as IU</th>
</tr>
</thead>
<tbody>
<tr>
<td>E_E1</td>
<td>Black civil rights</td>
<td>E_IU1</td>
<td>E_IU1s</td>
<td>Hello I'm gonna talk about civil rights</td>
<td>E_IU1h</td>
<td>Black green page emerging usage of black list</td>
<td>E_PIU1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Background history</td>
<td>E_IU2</td>
<td>E_IU2s</td>
<td>I'm gonna talk about</td>
<td>Black Civil Rights</td>
<td>E_PIU2</td>
<td>Black list</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E_E2</td>
<td>The American Civil War brought the slaves to an end in the Corinthian War of America</td>
<td>E_IU3</td>
<td>E_IU3s</td>
<td>how the black civil rights were forbidden in the south nation</td>
<td>E_IU3h</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>From the 18th of December 1867 slavery was forbidden in the south nation</td>
<td>E_IU4</td>
<td>E_IU4s</td>
<td>during the nineteenth century</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All Africans were all pronounced free and</td>
<td>E_IU5</td>
<td>E_IU5s</td>
<td>Black Civil Rights</td>
<td>E_PIU5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the legal rights for named participation</td>
<td>E_IU6</td>
<td>E_IU6s</td>
<td>Black Civil Rights</td>
<td>E_PIU6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 6. Example of merged transcription.** This is an example from the merged transcriptions of Emma’s texts.

There were four kinds of assignment components. In the assignment (appendix 2) the students were required to include background and information, a comparison to their own country, and their own thoughts on the issue. They were also required to include the sources they had used. The first three components, reflecting the main content included in the essays and audiovisual presentations, were labelled background, comparison, and reflections. The fourth component was labelled paratext. Paratext as defined by Genette (1997) has the function of framing the main text, presenting and surrounding it. The concept paratext was used for categorising parts of students’ essays and audiovisual presentations, which were outside the main text, for example names, titles, headings, lists of sources et cetera. In the transcriptions the assignment components were used as a starting point for a first level of categorisation.

For a second stage of produced data the merged and colour coded transcriptions matrices were adapted further to visualise transduction processes. The colour coded merged transcripts were first filtered, excluding columns for text, speech et cetera and only keeping the colour coded and labelled idea units and the column with images of the slides. This resulted in a matrix that was visually ‘cleaner’ than the full merged and colour coded matrices. This stripped matrix facilitated the visualisation of transduction processes. To achieve the visualisation of transduction processes, as shown in figure 7, the full merged transcript was needed as reference, and then each idea unit was examined and compared across the two columns, where the left side represents written text and the audiovisual text is represented to the right. Black lines were used to mark transferal of information/content and red lines indicated transformed ideas. Short red unconnected lines were used to mark idea units, which did not correspond to any idea unit in the ‘other’ representation of knowledge. First the idea units were compared starting from the column for written text. Then the direction of comparison was reversed and repeated going from the audiovisual text comparing across to the written text. This was done in
sections, bit by bit, going back and forth between written and audiovisual texts, so that processes of transduction were visualised across both text types in a parallel process.

Figure 7. Visualisation of transduction. This is a section from the adapted merged transcriptions of Daniel’s texts.

After the visualisation of transduction of ideas across written and audiovisual texts a second visualisation was carried out that focused on intensity of transduced themes (or concepts). In this visualisation the same filtered matrix as for the visualisation of transduction of ideas was used, but instead of indicating how and where idea units were transferred or transformed across written and audiovisual text, intensity of ideas was visualised. First dominant concepts were identified in the student’s essay and audiovisual presentation. Word clouds reflecting the frequency of lexical items (words), together with a close reading of the merged transcript, were used as a help in identifying the central themes. This allowed for a simultaneous and parallel reading of idea units across essay and audiovisual presentation in both verbal and visual modes. Once central themes had been identified in the student’s essay and audiovisual presentation text boxes for these themes were placed between the right (essay) and left (audiovisual presentation) columns of idea units in the matrix, and connecting lines were used to mark which idea units related to which theme. One idea unit could relate to more than one theme. For example in the illustration below (figure 8) an idea unit containing ‘civil rights for African American’ would be related to both ‘civil rights/equality’ and ‘race/colour’ and marked with lines from that idea unit to both text boxes representing central themes.
3.4 Analysing data

The students’ essays and audiovisual presentations are with this theoretical and methodological framework seen as material instantiations of the *ideational, interpersonal* and *textual metafunctions* (Jewitt, 2014c); the students (re)construct a social reality, interpreting and shaping signs (Selander & Kress, 2010) in a process of transferring information and shaping representations of knowledge, in a process of *transduction* (Kress, 2010, 2017). The *metafunctions* were in this study used as analytical tools. For analysing the *ideational* metafunction there were three areas of focus used; what has been included, what meaning was being made and, what processes are in action - classifying, analytical or symbolical (Kress, 2010; Kress & van Leeuwen 2006). The reader is reminded that the *classificational*, *analytical* and *symbolical* processes were originally used to reflect conceptual representation in images (Kress and van Leeuwen, 1996/2006). The students’ written essays were analysed for similar processes, where classifying (retelling facts, stating information) was used as corresponding to the *classificational process* in images, and when students analysed in writing that was used as corresponding to the *analytical process* in images, lastly symbolical writing was used for the written mode where a lexical items or a phrase had symbolical meaning rather than a straight forward literal denotation. Hence, in this study the use of these processes in action is expanded to include conceptual ideas in idea units where the modes can be visual and/or verbal, including both speech and writing. For the *interpersonal metafunction*, subjective positioning, style, language, closeness-distance, placement and gaze were considered. For the *textual metafunction*, principles of sequencing, coherence, cohesion, composition, linking information, given/new, centre/margin and framing were analysed (see table 4).
Table 4. **Metafunctions and analytical categorisation.** The table lists areas of analysis for each metafunction.

<table>
<thead>
<tr>
<th>Ideational</th>
<th>Interpersonal</th>
<th>Textual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Subjective positioning</td>
<td>Principles of sequencing</td>
</tr>
<tr>
<td>Meaning made</td>
<td>Style (language)</td>
<td>Cohesion and coherence</td>
</tr>
<tr>
<td>Processes in action</td>
<td>Placement</td>
<td>Composition</td>
</tr>
<tr>
<td>- Classifying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Analytical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Symbolical</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Three types and levels of coding were used, starting with the assignment components, *background, comparison, reflection* and *paratext*. The analytical categories the *ideational, relational* and *textual metafunctions*, and their related descriptive categories, *information* (including explanations and exemplifying), *relating to the reader* (including arguments and opinions) and *textual devices* (including linking and paratext) are shown in figure 9. Together these three ‘dimensions’ of coding make out the basis for analysis and interpretation. Colour codes were used for visually marking categories in the merged transcription matrices, and were used both for descriptive and analytical categories, where blues were used for the *ideational metafunction* and related categories, pinks for *interpersonal metafunction* and related categories, and shades of turquoise for *textual metafunction* and related categories.

![System for categorisation and colours codes](image)

**Figure 9. System for categorisation and colours codes.** Relations between analytical and descriptive categories, including assignment components.

Analyses were carried out in several steps using a comparative visual method adapted after inspiration from Smith et al. (2016). The students’ essays and audiovisual presentation were analysed separately.
and then together, starting with an iterative process (Kress, 2010). Then transcription and analysis was a process of going back and forth between the empirical material, matrices and coding categories, making it difficult to describe the process as clear cut and separate. There was a general order of working, which has been described here, but the reader should keep in mind that for every step along the way there has been sidesteps and retakes to make adjustments, and to note down observations and temporary conclusions. As a result both transcripts and analyses have been reworked multiple times, and in parallel to a (top-down) analysis of content and meaning making, analyses were carried out on detailed level.

The first level of analyses strived to answer the first research question, *how do students make meaning and represent knowledge about civil rights in the English speaking world in their written essays and in audiovisual presentation.* To achieve this *modes* were examined in the students’ representations of knowledge, their essays and audiovisual presentations. A basic assumption that follows from the multimodal social semiotic perspective used in this study, is that communication is multimodal and that the functions of communication are both changeable and context dependent (Halliday, 1978; Kress 2010; Kress & van Leeuwen, 2006). The emphasis in the analyses was placed on how the students as sign-makers chose and shaped signs to make meaning. For each student the merged transcription (figure 6) was used together with the parallel descriptions (figure 5) for answering the first research question. The analyses paid attention to conventions of modes (such as for writing) and how and what content was given shape in different representations. This included taking heed of how the students sequenced, and framed their written and audiovisual texts. Co-occurring (visual and verbal) modes were identified. The *metafunctions* were here used as analytical tools and the use of colour coding made them visible and ‘easy’ to read. For the first analytical tool, the *ideational metafunction* there were three areas of focus; what was included, what meaning was being made and, what processes were in action, classifying, analytical or symbolical (Kress, 2010; Kress & van Leeuwen, 1996/2006). For the second analytical tool, the *interpersonal metafunction*, subjective positioning, through style, language, closeness/distance, placement and gaze were considered. For the third analytical tool, the *textual metafunction*, principles of sequencing, coherence, cohesion, composition, linking, and framing were analysed (Jewitt 2014a, Kress, 2010; Kress & van Leeuwen, 1996/2006). The second level of analysis strived to illuminate the processes sought for with the second research question, *what are the affordances of written essays compared to audiovisual presentations for representing knowledge about civil rights.* To this end the different modes and their affordances were analysed. *Modal affordance* (Kress, 2010) was here a key analytical concept, for taking heed of what was possible for the students to express and represent with the use of a particular mode, and for analysing how the materiality of a mode shaped affordance together with social norms influencing the use of modes. Affordance was also active at the level of the essay and audiovisual presentation, these text types or media also carry affordances that make them more or less apt for certain kinds of meaning making (van Leeuwen, 2005, 2011). In other words these analyses looked at differences between the written and audiovisual representations of knowledge, and what was possible to express and how this could be done, using the two different types of text, written and audiovisual. *Transduction* processes, across the students’ written and audiovisual texts, were analysed with the intent of answering the third research question; *how can the students’ text production be understood in terms of transduction.* Here two separate visualisations were used to reveal how students transferred, or transformed, ideational, interpersonal and textual meaning (or not), and also the intensity of meaning transcuded as well as the density of transduction. These visualisations were yet another level of processing data (see table 3).
The visualisations of transduction were created for each student using the merged transcriptions. These were filtered to exclude written text, only leaving the label of the idea unit and the colour coding. With these visualisations it became possible to ‘read’ not only which idea units were translated across written and audiovisual text, but at what density and also which idea units were only represented in one, or the other, of written or audiovisual text. Adapting the merged transcription resulted in what I have called stage two of produced data in table 3. These were first the visualisations of transduction across written and audiovisual text (figure 7) and secondly the visualisations of intensity of ideas transduced (figure 8). The analyses of transduction used the metafunctions of language (Halliday, 1978) and communication (Kress & van Leeuwen, 1996/2006) as analytical tools and started from the transduction of ideational meaning as reflected in what content was transferred or transformed between each student’s essay and audiovisual presentation. Then transduction of interpersonal meaning across essay and audiovisual presentation was sought through the analysis of style and subjective positioning. For the analysis of transduction of textual meaning focus was placed on how the textual features, and organisation across the written and the audiovisual text were transferred, translated or transduced. The analyses of transduction also looked at proportions of ideas transferred, translated or transformed across written and audiovisual modes and text. This was done by estimating proportions of ideas transferred and translated, in relation to ideas transformed or not transduced at all, in both directions, that is from essay to audiovisual presentations and vice versa. Transduction can be studied from several angles. This study also used an analysis of intensity of ideas in the transduction process across the written and audiovisual texts where common central themes or conceptual ideas in the students’ essays and audiovisual presentations were used for the visualisations. Word clouds, where the most frequent words show up as larger text, were used to show frequency of concepts in the students’ written and audiovisual texts, which is one reflection of content and the ideational function. In this way it was possible to reveal where the students placed their focus and to find differences and similarities in how the students have focused their meaning making. The concepts revealed with word clouds, together with close reading of the merged and colour coded transcripts, were used for the visualisations of the intensity of ideas. Intensity is a semiotic feature and an essential feature in meaning making (Kress, 2017). Intensity is analysed for revealing where (implicit) conceptual focus has been placed in the processes of making meaning (Kress, 2010), when the students have given shape to their knowledge in the form of essay and audiovisual presentation. When looking at intensity of ideas in the transduction process across the written and audiovisual texts the most salient or central themes (or conceptual ideas) were identified. The intensity of ideas transduced across written and audiovisual texts was analysed using the matrices for visualising intensity. These clearly revealed what themes proved most central, and how and if the intensity differed between ideas in a student’s essay and audiovisual presentation. The analyses of transduction then used the metafunctions of language as a starting point for further analysis and as a basis for discussing the third research question; how can the students’ text production be understood in terms of transduction.

3.5 Trustworthiness

The ontological, epistemological and methodological choices made in the process of this study, have affected the research process (Moss et al., 2009; Rorty & Skirbekk, 2004; Scott & Usher, 2011) and should be considered when evaluating elements of trustworthiness. In Moss et al. (2009), and in Golafshani (2003) criteria and touchstones for quality or rigour in qualitative research are discussed and defined. In the following I will deal with issues of trustworthiness with reference to the criteria suggested by Floden in the article by Moss et al. (2009), and by Golafshani (2003). However, as
Höglund (2017) points out, trustworthiness is not something that can only be attended to in one separate section, but it "is the sum of the study as a whole and is thus omnipresent throughout" (Höglund, 2017, p. 94).

The criteria Floden defines in Moss et al. (2009) are clarity of central concepts, that the research should deal with questions or topics relevant to the field, and that a study should have a solidly based argumentation clearly tied to earlier research and literature as well the new empirical material. This study has striven to be concise in the use of central concept and categories. Clarity of central concepts is a key element for trustworthiness, as these concepts are used to describe the focus of a study, and ambiguous use of central concepts leads to decreased quality and trustworthiness in a study (Moss et al., 2009). An area highlighted by Floden (Moss et al., 2009) is that when new methods are used, these need to be firmly anchored and connected to other research. In this study there are partly new comparative methods used with the development of new forms of (merged) transcription matrices. However these have been grounded in and adapted from previous studies such as Smith et al. (2016) striving for clarity in how and which earlier studies have been used as inspiration for adjusted comparative methods and adapted transcriptions. Floden, in Moss et al. (2009), also discusses the problem of lacking evidence, which can make it hard for a reader to follow and evaluate the process of going from empirical material to conclusion. Without clear structure and account for the process and work with empirical material the reader cannot evaluate the quality and trustworthiness of a text form the point of research quality (Moss et al, 2009). This study has striven for clearly documenting and accounting for all parts of the work process, and to clarify and visualise the construction of the study and different stages in method and analyses with the use of figures. Golafshani (2003), just as Moss et al. (2009) emphasise quality and rigour together with trustworthiness for research in any paradigm. In qualitative studies it is important with precision and credibility and transferability, to be able to transfer results and methods to other contexts (Golafshani, 2003). The concept trustworthiness should here in this study be understood as synonymous with credibility. Qualitative studies, including this study, strives to illuminate and understand phenomena, and later to be able to extrapolate the results to other contexts and phenomena in the world. Objectivity as such is in this context not a mark of quality or trustworthiness, and the involvement of the researcher should not be seen a hindrance but could be part of the method and the underlying data, but the research should show trustworthiness in all parts of the research process (Golafshani, 2003).

Another way to evaluate trustworthiness in qualitative research, that strives to create understanding of phenomena, which are context dependent and context specific (as in this study), is the truth value of the study (Golafshani, 2003; Moss et al., 2009; Rorty & Skirbekk, 2004). In interpretative research, where this study is situated, it should be understood that the perspective and position of the researcher shapes the research, and that "reflexivity is an attitude of attending systematically to the context or object of study" (Höglund, 2017, p. 95). This study has striven to be transparent as well as reflexive in the design of the study, methods used, criteria for description and analysis, construction of transcriptions and matrices, as well as for underlying presuppositions and the use of analytical tools. Hence, this study has been constructed with the criteria for quality, rigour and credibility discussed above in mind, and the trustworthiness of this study should be evaluated considering the study’s context dependent, interpretative and reflexive nature.
3.6 Ethical considerations

Any research involving people need to take into consideration ethical aspects of the study. "A basic responsibility of the research community is to formulate the principles of research, to define the criteria for proper research behaviour" (All European Academies, 2017, p.3). There are several important aspects to consider especially in a study involving young people who are in a vulnerable position, and "it is imperative that risks and harm be minimized" (Swedish Research Council, 2018a).

A central aspect has been the confidentiality of the students and identifying information was anonymised according to the rules and regulations in the Codex of the Swedish Research Council (2018c) and the European Code of Conduct for Research Integrity (All European Academies, 2017). The ethical responsibility resides with the researcher (Swedish Research Council, 2018b) and ethical considerations and reflections need to be part of the researcher’s daily work (Government of Sweden, 1999). Ethical aspects involve all stages of the research process, from collecting and working with the empirical material of producing data and of keeping the identity of participants confidential (Swedish Research Council, 2018c). Students were informed about this and in the letter of consent the students had three choices (appendix 1). One option was to decline. The second option was to agree to take part in the study but exclude the use of his/her empirical material for examples in seminars, or to be presented at conferences. The third alternative was to take part in the study and to allow the use of the empirical material as examples in seminars and conferences. All six students represented in this have study allowed for the use of their material both in the study and as examples in seminars and at conferences. Taking part in the study was voluntary and the students have given their written consent to take part, and were given information about the study and participation both orally and in writing (Swedish Research Council, 2018c). The students were all over 18 when asked to participate and hence no permission from legal guardians was needed. The students were informed both in text and speech about the purpose and shape of the study, and had the opportunity to ask questions and to discontinue should they have wished to do so. All data and information has been de-identified for confidentiality according to the Codex of the Swedish Research Council, with rules and regulations for research in the humanities and social science, in order to conform with "ethics codes and laws that regulate and place ethical demands on the research process" (Swedish Research Council, 2018c). The participants have been de-identified and given fictive names in the study, as have the groups they belonged to. Identifying features (names, class et cetera) have been excluded from all transcriptions, figures and examples, and there are no photos used that show the students. The participants have been informed that results are reported as text and that no identifying information has been included. The data, six essays and six audiovisual presentations, was stored where I and the supervisor of this study have access but no one else. All other empirical material collected, but not used in this study, has been stored where only I have access. Ethical consideration in this study included that the students had been taught by me. The relationship between the researcher and the student have in this respect not been neutral, which would have been preferable (Scott & Usher, 2011). However, the students were informed about the study and asked to participate after the course was completed and grades had been set. This meant the empirical material was produced before the construction of this study, and before the essays and audiovisual presentations were retrieved from the school’s Learning Management System. The students were no longer taught by me when the actual work with transcribing and analysing the material started. In some situations the results of a study could be significantly affected by the researcher’s presence and/or intent with a study (Scott & Usher, 2011, p.139), but in this way the study could not affect the students’ learning situation or grades in English, nor could the study affect the students’ production of the essays and audiovisual presentation.
Chapter 4 Results

This chapter presents the results of the study, based on analyses of the students’ essays and audiovisual presentations. The essays and audiovisual presentations are first described, then the analysis of the first research question, how do students make meaning and represent knowledge (about civil rights in the English speaking world) in their written essays and audiovisual presentations, is presented, followed by the results of the analysis of the second research question, what are the affordances of written essays compared to audiovisual presentations for representing knowledge (about civil rights). Presented last here in chapter four is the third analysis for revealing the process of transduction across the students’ written and audiovisual texts. This is followed by reflections on meaning and transduction after the third research question, how can the students’ text production be understood in terms of transduction.

4.1 Descriptions of essays and audiovisual presentations

Ada’s essay is about the American black civil rights movement in the 1950s and 1960s, in the USA, against a backdrop of legislation and segregation and their histories. Examples of laws and effects of segregation are given. Martin Luther King Jr. and Rosa Parks are highlighted as important people. Civil rights in Sweden are mentioned in a contemporary context. No images are used. Ada’s essay is substructured by the use of subheadings and bullet points, and uses blank lines to delimit different parts of the text. There is a list of sources included at the end. The audiovisual presentation deals with the same topic as the essay, the American black civil rights movement in the 1950s and 1960s. Segregation and discrimination are exemplified and shown in photographs. The audiovisual presentation uses a solid black background with large white letters. Ada talks about the Jim Crow laws and uses photographs of Martin Luther King Jr., and a young Rosa Parks. There is no after-text or sources included, and there is no mention of, or comparison to, Sweden. The audiovisual presentation is quite short, slightly over two minutes, and stays at an informational level.

Camilla’s essay is about the Black Civil Rights movement in the USA in the 1950s, the legislative background, and changes that came into effect. The contemporary civil rights situation and movement is also mentioned, as is Sweden today and in the past. Camilla uses a title and a subheading to structure her essay, as well as paragraphs separated by blank lines. She has included a list of sources. Camilla’s audiovisual presentation is about black civil rights, on the same topic as the essay. The audiovisual presentation uses a beige-yellow background, writing in grey text colour, and has seven separate slides, which in turn have built in text animations. The slides are substructured with headings, subheadings (or bullet points) as textual animations following the spoken contents sequential order and by the topic of the images. Three slides have no images but only writing, but use built in animations of text elements. Camilla paces her speech with the information in writing as this appears in the frame. There are both black-and-white images and one colour photo. The audiovisual presentation begins with showing the title and a black-and-white photograph. In the image we see black people demonstrating for civil rights. The audiovisual presentation then deals with background,
explaining the situation before the civil rights movement. Legislation is mentioned, that it became “illegal to separate races in 1964”, and that black people were allowed to vote in 1965. Camilla states that the movement still goes on, and explains and exemplifies why. Sweden and the USA are compared and both differences and alike goals are mentioned. The text “a comparison to Sweden” is shown in block letters top left in the frame, and a close-up colour photograph of hands in a handshake by a black and a white person. Camilla ends with giving her own opinions and then the audiovisual presentation finishes somewhat abruptly. No after text or sources included. The presentation is not quite three minutes long.

Daniel has chosen black civil rights in the United States for his essay topic, and takes his starting point from a global contemporary viewpoint and then backtracks to the 17th century, the colonisation of the ‘new’ world and the slavery system. Daniel continues with the American Civil War and the 19th century and then brings the reader forward to the civil rights movement in the 20th century. Daniel takes up colonisation and the horrors of slavery, the Civil War and the economic factors behind it. The essay shortly mentions the black civil rights movement and Martin Luther King Jr. Daniel finishes with reflections on the people who introduced slavery giving his opinion, and concluding that we cannot change history. No images are used. Daniel uses an underlined title and paragraphs divided by blank lines to structure his essay. There are no subheadings or bullet points used, nor is there a list of sources included. Daniel’s audiovisual presentation is introduced in writing. “Black peoples civil rights in the united states today”. Daniel uses a white or light grey background and black text, except for one slide showing a map where text colour is used corresponding to colours on the map. There are seven slides and no animations used. Photos and illustrations are both in black and white and in colour. Writing in slides is short and used to substructure the content. The topic of images and text follows the spoken content. The presentation begins with an introduction stating the topic and content. Two images are shown, an illustration of US flag, and a colour photo of a crowd of people of all different ethnicities. Next Daniel moves to the slavery system and we are shown a sketch in black-and-white of slaves working in the fields under supervision of white men with whips. Daniel then moves on to the Civil War, which is illustrated with a painting in colour of two soldier crossing rifles, and below this we are shown the flags of the North and the South. Daniel then uses a map to show how the states were divided. After the section about the Civil War Daniel moves on to the 20th century, the civil rights movement, and the end of segregation, showing a black and white photograph of Martin Luther King Jr. talking to a huge crowd. Daniel concludes his presentation with a comparison between Sweden and the USA illustrating this with two maps and flags in colour. The presentation is almost six minutes long. Daniel includes his sources as the presentation is carried out (that is they are not listed at the end but embedded in the flow of the presentation).

Emma’s essay deals with black American civil rights in the USA, starting with the American Civil War as the end to slavery. The text then moves forward to the 19th century with legalised separation of people after colour giving explanations and examples, and then to 20th century and the different situations in the South and North and the start of the civil right movement. Emma informs, describes and discusses the black American civil rights movement against a backdrop of historical causes and legislation. She compares to Swedish society, and the situation for “people with different skin colour” and reflects both on contemporary and historical situations and their causes. After the body of the essay Emma has included a list of sources. Emma has also included an image of a black fist, which is placed to the right of the title. Emma includes title as well as subheadings. The text is clearly structured with paragraphs divided by one or more blank lines. Some paragraphs are short others substantially longer. Emma’s audiovisual presentation is called “Black Civil Rights”. The
presentation starts with a solid black frame and then has four separate slides, which use a pale green background with writing in black and two different shades of red. There are also several different built-in animations and transitions used in the slides, such as an emerging fist, which later burns and 'disappears', or text that appears with a 'flash' of light. Some slides use no animations at all. In other slides images are ‘slided’ into the picture one by one, or text appears one line at a time. The transitions between slides are also differently solved. From a central inverted zooming of writing as it appears, to a flipping or folding page. The slides are substructured in different ways but apart for the title slide, each following slide has a substructure where Emma uses text items and/or images to this end. Animations follow the sequential order of the spoken content, and the topic of the images and/or text items. The last slide uses no images, while the rest of the slides use image and writing in combinations. Emma paces her speech with the information in writing that appears in the frame. She uses only black-and-white images, which can be drawings or photographs, while for text items there is a variation in colour between black and red text items. The presentation starts with a blank page. Emma starts speaking before the first written text, and an image of a raised black fist is shown. Emma gives background starting with the end of slavery, in 1865, and the policies of separation that followed, emphasising legislation and giving examples. The presentation moves on to the US black civil right movement in the 1950s and 1960s, presenting Rosa Parks, Malcolm X and Martin Luther King Jr. Emma ends her presentation with comparing “today vs then”, and finally a brief comparison between Sweden and the USA including a few reflections of her own. The presentation is 4 minutes long. No sources are included.

Fanny has chosen a topic on civil rights for indigenous Australians, and starts her essay with a quotation from former Prime Minister Kevin Rudd apologising for the separation of aboriginal children form their families”. The quote is used as a subheading, which takes on the character of a lead in news article. Fanny’s essay takes up the 20th century situation in Australia. Fanny writes about how indigenous Australians were considered a problem by white authorities and how (white) society actively set out to destroy aboriginal culture (and people). The essay states the problem and gives examples of how these policies were effectuated. Fanny then compares this to how the Sami have been treated in Sweden and makes parallels to Nazi racial ideologies. Fanny’s essay ends with reflections and opinions. At the end there is list of sources. No images are used and the text is structured in paragraphs using blank lines to delimit one paragraph from the following one. Fanny’s presentation begins with an empty solid black frame and then Fanny uses one single slide where the frame is filled with a black and white photograph of indigenous Australian men, and a boy, engaged in some traditional activity. Fanny deals with the 'stolen generations’ of Australian indigenous children, starting with stating her topic and then a sound clip of the former Australian Prime Minister Kevin Rudd’s official apology from the nation to Australia’s indigenous peoples. Fanny shortly explains the government policies and the background that resulted in the removal of indigenous children from their families. The presentation is short, not quite one and a half minutes long and stays only at an informational level. No opinions, reflections or comparison are given, and no list of sources is included.

Greta has also chosen to look at the ”stolen generation” and civil rights in Australia. Her essay deals with the period between the 1890s to the 1970s as a dark chapter in Australian history, when white society tried to eliminate the indigenous population, first their culture but then the people by 'breeding the black out of them’. Greta describes the governmental child removal policy and where indigenous children were taken from their parents, and badly treated in a process aimed at making them 'more white’. Greta gives examples and uses quotations. There is a short comparison to Sweden and the
Sami. The essay ends with Greta’s (emotive) reflections. The text uses a title, subheadings and bullet points. The text is short and so are most paragraphs. The paragraphs are divided by blank lines and the different parts of the essay are marked with subheadings in the form of bullet points. A list of sources is placed at the end. There are no images used. Greta’s audiovisual presentation has two slides that both use a solid black background. The text on the first slide (the title slide) is golden yellow and on the second slide light grey. The second slide is substructured with bullet points as textual animations following the spoken contents sequential order and by the topic of the images. Greta paces her speech with the information in writing that appears in the frame. She uses both black and white images and one colour photo. The presentation begins with showing the title and a stylised colour photo of an aboriginal man caught in movement and holding a lifted branch. The background is in reds and yellows. A huge golden yellow circle fills most of the background. The second slide has two images, a colour photo of an indigenous Australian woman holding a baby, and below a black and white photo of a woman in Sami traditional clothes leading three laden reindeer across a subarctic landscape. The audiovisual presentation starts with comparing the ”aboriginals” and the Sami and then stating the content of the presentation ”how people wanted these aboriginal to die out”. Greta takes her staring point in the early 19th century and the ”dark chapters of … history”. Greta gives background and examples of how the government tried to make Australia a white nation, and how this affected the people subjected to these policies. Greta continues with comparing to Sweden and the (historical) situation of the Swedish Sami. Greta ends the presentation with arguments and her own opinions and feelings on the subject.

4.2 Analysis 1

The metafunctions of language (Halliday, 1978) and communication (Kress & van Leeuwen, 1996/2006) are active simultaneously but as this thesis is a written text the sequential logic of writing supplies the principle for organising and ordering the text (Kress, 2010), and all following analyses start with the ideational function, then deal with the interpersonal function followed by the textual function.

4.2.1 The ideational analysis

For revealing ideational meaning in the students’ essays and audiovisual presentations focus was placed on the content the students are using in their process of making meaning. Ada’s essay is shaped around content about race, segregation, legislation and rights. Content related to race is not only most frequent but also highlighted. Martin Luther King Jr. and Rosa Parks personify the civil rights movement, and Mahatma Gandhi is used to exemplify non-violence. In the comparison to Sweden, the focus is on the role of government and institutions rather than on individuals. About civil rights in Sweden Ada takes up freedom of speech, religious freedom, but also the social security system as a right in Swedish society. In her concluding remarks Ada includes the topical (political) situation in Sweden with a recent influx of refugees and existing racism. Most of what Ada writes is classifying and giving information, such as ”Rosa Parks was born 1913 in Alabama she was an African American civil rights activist. During the 1950s Park worked as a secretary in NAACP, National Association for the Advancement of Colored People”, and only a small part of the text is analytical in any form, for example, ”I think that the racism in Sweden becomes more secretly and people keeps there thoughts to them selfs because deep down everybody knows it’s wrong”. Ada’s essay paints a picture of a successful civil rights movement in the USA and of civil rights gained by the black American population. The meaning Ada is communicating is that today all US and Swedish citizens have the
same civil rights regardless of race or ethnicity, but that historically people in the USA who were not white (or in Sweden ethically Swedish) were discriminated and had to fight for their (civil) rights. However, Ada points out that negative treatment of immigrants takes place in Sweden even though there are laws against discrimination. Ada is putting what she has learnt about the black civil rights movement in the USA in relation to what she knows about contemporary Sweden, her world, and issues of racism, power and discrimination.

Just as in her essay, Ada focuses the content in the audiovisual presentation on segregation but in the audiovisual presentation no reflections or comparison to Sweden are included, which differs from the essay. The dominance of classifying processes is even more striking than for the essay, with an almost exclusive use of classifying processes in the verbal modes, such as, "there were black and white fountains., white fountains had cold water, black fountains had lukewarm water", or "The fourth of April nineteen sixty eight (1968) Martin Luther King gets shot in the head while he is planning a demonstration from a hotel balcony in Memphis". However, images contribute with symbolical processes, as in the image in the opening slide. Here we are shown a demonstration. A black and white man are walking abreast, together carrying a sign between them. The white man is wearing dark clothes, the black man is wearing white. There are images active for all three slides, and classifying and symbolic processes are active simultaneously all through the presentation. In this way it can be argued that the presentation is divided equally between classifying processes (using verbal modes) and symbolic processes (in visual modes).

Camilla has chosen to focus the content in her essay on segregation, and the black American civil rights movement in the mid-20th century. The essay explains the civil rights movement as a struggle for equal rights with a background in legal segregation. Facts are clearly stated, but Camilla does not exemplify to any large extent, and there is a complete lack of detail in the few examples given. Camilla specifically compares to black people in Sweden, which is a fairly modern concern. Camilla is painting a picture of an important movement, which is still relevant as segregation and discrimination still exist. About half of the idea units in Camilla’s essay represent classifying processes and almost half represent analytical processes. This is visible in the following excerpt from Camilla’s essay.

"Before the movement it was decided that black people and white people would have the same rights, but in different places. This led to different seats in the busses, and different schools for black and white people”. The first sentence is stating facts, classifying, while in the next sentence Camilla explains (analyses) what effect this had. This means Camilla is re-presenting information, stating facts but adding reflections.

The history however is different in Sweden according to the US. Since we didn't have so many black people here, and there were no different schools for example. My own thoughts is that I think it’s very important to highlight this events because is wasn't so long since this occurred. Certainly we have come a long way in a relatively short time, and we are quite equal to each other. But discriminations still exist.

Here Camilla is relating what she knows about the US black civil rights movement to her knowledge of a contemporary Swedish situation.

In the audiovisual presentation Camilla’s choice of content is focused on the black civil rights movement and the struggle for equal rights including the background of segregation, which is in line with the focus in the essay. Just as in the essay Camilla choses to compare the situation of black people in the USA with Sweden both historically and for today, although briefly and without extrapolation. The choice of photographs clearly exemplify Camilla’s topic, the black civil rights
movement, putting a face to the people involved. Only black people are shown in the photographs. Most of the ideas in the verbal modes were identified as classifying processes as when Camilla says "and the black civil rights movement was about black people fighting”. There is a difference here between the two different media of representation, where the essay had ideas more evenly distributed between classifying and analysis. If we look at duration instead, symbolical processes have more weight than a count of idea units would indicate. The images serve a symbolical purpose, and are active in parallel to verbal modes in the audiovisual presentation. In the audiovisual presentation classifying or analysis in verbal modes and symbolical processes in the images are active simultaneously.

Daniel’s essay places focus on slavery, the Civil War and the economic reasons for the situation out of which the black American civil rights movement was born. The essay explains the slavery systems indicating the scope of the system and the conflicts such as the Civil War. The written text stays on a general and informative level. "At year 1860 Abraham Lincoln was elected president, this caused some very big troubles because Abraham Lincoln where against-slavery”. Daniel includes his own thoughts.

So I think that if they knew this they would never ever have done what they did. I really think that the black people should have got the same civil rights as white people from the start, it shouldn’t have taken years of slavery and unequally civil rights. According to me this should never have happened.

However, there is nothing said about Sweden and no comparison to Swedish context in the essay. Daniel is classifying and analysing (or reflecting) in equal proportions in this essay.

Daniel’s audiovisual presentation largely follows the content of the essay with focus on slavery, the Civil War but with some more weight given to the civil rights movement, and a section discussing women’s rights in Sweden in the early 20th century. "The issues of civil rights regarding black people in America can be compared to the women’s civil rights here in Sweden because actually women weren’t allowed to vote until 1919”. The comparison of civil rights issues in the USA with women’s struggle for the right to vote in Sweden is only mentioned in a few sentences and is not developed further. Daniel places a lot of focus both on the system of slavery (and its horrors), "a horrible slavery system with true waste”, developing the historical reasons and roots out of which the (modern) civil rights movement in the USA was born, "the issues were of different rights of different states” and about the North, “farming were not that important slaves wasn’t needed”. He is here developing and understanding of how this could have happened expressing hope that things could have been different if people had understood what slavery would lead to. "They did probably not know that this would be the start of a horrible slavery system with true waste", and later in the audiovisual presentation he is widening this to encompass inequality between the sexes. "I think it’s really awful that women didn’t get to vote much earlier”. The sense Daniel’s two texts bring is that it was bad, but that things are all better now. The pattern of classifying and analysing is the same as in his essay in the verbal modes, with an even number of each, but here we also find symbolical processes active in the images all through the audiovisual text. We primarily find the symbolical processes active in the images used, such as the image of a white man (Lincoln) speaking with black people sitting at his feet, looking up at him. In duration the images are active all through the audiovisual presentation, which creates a situation where the symbolical processes are active parallel to both classifying and analytical processes in the verbal modes. The visual modes do not just represent symbolical processes. There are also elements of classifying and analytical processes at work in the images, such as in the use of maps, which can be interpreted as having all three processes active at the same time.
Emma focuses the content in her essay on segregation, mistreatment and the dissatisfaction that led to the civil rights movement, "that underlying bitterness and memories from the war could be an explanation of why the black’s were so badly treated", and then on the civil right movement. "The movement was started in order to end the racial segregation and discrimination and to fight for equal civil rights". Lastly Emma writes about Sweden and the influence from Nazi ideologies in the beginning of the 20th century; "Not forgetting that Sweden, during the second world war, shared the Nazi ideology that parts of Europe shared”. The meaning Emma is re-making in her essay can be described as legalised segregation of people in the USA, how this later led to protests and the civil rights movement, and that Sweden has its dark chapters of history with influences form Nazi ideologies and ideas about people and race. Emma exemplifies and problematises her topics to some extent. "In the Southern states of America, old memories from the slave era remained, and so did the old prejudices to. I think these situations arises from lack of knowledge, and maybe from fear". Emma choses to focus part of the text on possible explanations for the situation in the South, which she tells us was worse than in the North, and points out that not only black people were discriminated but other underprivileged groups as well. In the context of the civil rights movement Emma takes up the Montgomery bus boycott as a trigger. For the contemporary US situation Emma points out that today all citizens are equal in the eyes of the law, but that the reality is something else. Emma explains that Sweden did not have a black population comparable to that in the USA in the 1950s-1960s, but that Sweden (with a glance at Nazi ideologies) practiced different forms of segregation in other ways. There is a slight emphasis of classifying processes in Emma’s essay, but about half of the ideas are analysis or reflections.

In Emma’s audiovisual presentation she focuses on segregation and the background for it, which is in line with the focus of her essay. The last part of the presentation takes up Sweden’s history and lingering prejudices both in the USA and Sweden and discrimination in society. She is here brief in what she includes about Sweden. Compared to the essay, the focus is more directed towards segregation and what this could look like. Emma does this through the examples she presents and though the use of images and photographs, such as the image of a black man drinking from a separate water fountain next to a bigger and better water fountain. About half of the ideas expressed in verbal modes in Emma’s audiovisual presentation represent classification, and almost as many are analytical, but symbolical processes identified in images were active for most of the presentation, with visual modes co-occurring with verbal modes. If we look at it like this, then we can say that in the audiovisual presentation symbolical processes are active to at least the same extent that the analytical and classifying processes are.

Fanny starts her essay with facts and figures about 'the stolen children' and a quotation from (former) Prime Minister Kevin Rudd’s speech; "We apologize especially for the removal of Aboriginal and Torres Strait Islander children from their families, their communities and their country”. The problem the essay takes up is clearly and succinctly introduced in this manner, somewhat like a lead in news article. Fanny focuses on the aboriginal community being seen as a problem by official Australia and the official policies of trying to get rid of this problem and taking the children, and the abuse and mistreatment of aboriginal children this resulted in. Fanny also takes up Sweden, the Sami and the ideas of racial biology that flourished in the early 20th century. Most processes in action in Fanny’s essay represent classifying processes. "If they did not obey and were caught talking an Aboriginal language they were severely punished". A few are analytical. "This made the Aboriginals incapable to pass on their culture and way of living". The meaning Fanny is making is represented as re-shaped knowledge about aboriginal children being taken from their families and that the black population was
considered people of less low value. For Sweden Fanny draws the parallel to the Sami and how Swedish society also treated indigenous populations as of less worth under the influence of ideologies of racial biology. "Just like the Aboriginals our native people had to convert to Christianity and were examined”.

Fanny’s audiovisual presentation only reflects about a fourth of the content in the essay, stopping at the fact that children were taken. The focus of the presentation is on children being taken and that an apology was offered. Fanny here uses a voice clip with PM Kevin Rudd. "For the pain, suffering and hurt of these Stolen Generations, their descendants and for their families left behind, we say sorry”. The one image used shows us what aboriginal people can look like, but does not reflect the content given in the verbal modes. In the audiovisual presentation about half of the idea units represented in verbal modes were identified as classifying processes, but the image contributes with added symbolical processes.

Greta’s essay is about the official removal of Australian indigenous children from their families and how these children lost their langue, culture and were abused; "Some of these children left to never see their mothers or siblings ever again, and this left individuals scarred for life”. Greta then briefly compares to Sweden. Here the focus is on the Swedish Sami, and how society has treated this part of the population, and concludes with her own reflections. Approximately half of the text is about Australia, where the second half of the text deals with Sweden, Greta’s own reflections and the list of sources. However, the main focus of the content in the essay is Australia and how the 'stolen children’ were treated, and that Australian society had a policy with the aim to remove the 'black’ from the population. In the second half of the text more weight is given to Greta’s own thoughts. "I don't understand how people could be able to think or act like this”. This part of the text makes up almost a third of the essay. The reader is set both in time and space, 1820-1970 in Australia. We learn that the children were taken because the authorities reasoned that, "within three generations, Aboriginals would have died out if they had children with white people”, and children were then taken from their mothers and robbed of their aboriginal identities. In Greta’s essay we see that most of the idea units can be identified as classifying processes and considerably fewer were analysis or reflection.

In Greta’s audiovisual presentation the focus, just as in the essay, is on the child removal policy, the stolen children and what this did to them and how they lost their culture, their families, the language and their identity. The presentation carries more emotion than the essay, effected by the impact of the images but also in that Greta adds and develops some more of her own thoughts, and interjects these in her spoken narration. "These children even got their names changed to what they called normal white people’s names like James or something”. In both the essay and the audiovisual presentation Greta is expressing horror, clearly distancing herself from any of the thoughts or ideas that led up to these policies; "I don't understand how based on peoples skin color or culture it can be so offending to someone, that they want these people to die out”. For Greta’s audiovisual presentation there were idea units where symbolical processes were identified as being active. These were supplied by the use of images. As the images are present in the entirety of the presentation, symbolical processes in the visual mode are active at the same time as the classification and analysis in the verbal modes. The images do not change though, but stay the same, although continuously present. About half of the ideas represented in verbal modes were classification and the rest analytical.

4.2.2 The interpersonal analysis

The interpersonal metafunction in the students’ essays and audiovisual presentations become apparent in how they use subjective positioning, language and style, but for revealing the interpersonal
*metafunction* in the audiovisual presentations there are added elements for images to consider, and elements of closeness/distance, placement and gaze. Using visual elements such as images and animations add affective layers to the knowledge represented, and the meaning made by the students in their audiovisual presentations.

Ada stays at a neutral and informative level in her essay. An impression that is reinforced by the structure with short paragraphs, and the use of subheadings and bullet points. Most of the text is distanced from the subject. The very last paragraph, where Ada gives her own opinions, changes tone and directly relates to the reader, speaking to our emotions; "I think that the way black people were treated in the us in that time is just terrible, a bit frightening and almost unreal”. She explains that "you should not be treated differently because of the cooler on your skin", relating her following opinions and arguments to the contemporary situation in Sweden. She then ends the essay with a circular reference back to her starting point with "I think that the way black people were treated in the us in that time is just terrible”.

In Ada’s *audiovisual presentation* there is the added information from images and visual modes, and a following need to consider placement and gaze as well as style, language closeness/distance. The image in the first slide shows a black-and-white photograph of a demonstration. At the very front a black and a white man are walking together carrying a sign between them, a form of written mutual statement. The white man is wearing glasses and head held high, chin slightly up looking straight into the camera, straight at us, giving an impression of confidence, and maybe just a hint of belligerence and a will to fight. The black man on the other side of the sign is looking down, gaze directed slightly to the side not meeting anyone’s eye. He is also holding his head slightly lower. His body language is giving the association of someone saying ’I do not want to pick a fight’. Behind these two men there is a crowd of men walking abreast. The white man can probably ‘afford’ to be more confrontational, as there should be less risk for him being white. That is one possible interpretation of what this image communicates. The second slide has two black-and-white photographs of bus stops with signs for separate waiting rooms 'white’ or coloured’. The image with the sign for the white waiting rooms, shows this as being placed at the front entrance, while the coloured waiting room is clearly placed in a back street or a back entrance. These images show us not only that there were separate waiting rooms, but also that being black meant having to use 'the back entrance’, metaphorically speaking not being allowed through the front door. The last slide has two images as well, one of Martin Luther King Jr. in profile with his arm and hand raised to an enormous crowd (in Washington DC), and below this a smiling Rosa Parks. This is a pleasant and relaxed and Rosa Parks we are shown. The photograph has the character of a private snapshot, which creates a feeling of closeness, intimacy and engagement, as if you knew her personally. It creates a sense of relationship with the Rosa Parks in the image. Martin Luther King Jr. is more distanced, more official. The enormous crowd shows us how popular and important he was. In verbal modes Ada moves the audiovisual text forward in a linear fashion from segregation to the civil rights movement, while the visual modes show a circular movement from the first image of a civil rights demonstration over images illustrating segregation back to the civil rights movement personified by the photographs of Martin Luther King Jr. and Rosa Parks.

Camilla uses a distanced and objective informative style in her essay. The last part of the essay briefly gives Camilla’s own thought on the issue, but his too is objective in style, distanced and informative, although she does relate the reader and herself with the common ground of being human when writing, "We’re all just humans”. Camilla moves in a linear fashion form a general objective position at the beginning of the text to her subjective position at the end. Although even this is delivered in an informative manner.
In Camilla’s *audiovisual presentation* the image in the opening frame shows a row of people in a demonstration. First there is a black man with his gaze directed downward, behind him a black woman, smiling, but also looking down. The third person is a white woman who is wearing sunglasses, but from her posture she seem to be looking straight into the camera. The first two (black people) are averting their eyes in non-confrontational way. The third person, a white woman, appears not to consider having to be non-confrontational. She is looking rather neutral but proud. There is an implicit message here. Black people demonstrating for black rights have to be careful not to elicit violence. The effect of the image is to create empathy for these people, who are appearing humble and non-threatening, only asking for the same rights as other people have. In effect asking to be seen as people, and this immediately engages the reader of the audiovisual text and creates a form of common ground, our humanity, and a wish to be treated fairly. The photo of Rosa Parks shows her smiling and looking just slightly off camera. The scene is pleasant, and Rosa Parks is looking nice and friendly and relaxed. The choice of this photograph, showing us a more ‘private’ Rosa Parks, creates a feeling of intimacy and engagement, as if you knew Rosa Parks, which makes us relate to her at an almost personal level. This photo also engages the feelings of the reader, creating a sense of relationship with the subject in the image. Martin Luther King Jr. is shown in the third photograph Camilla has used. Interestingly she has chosen a photo from a situation where he is not in front a large crowd, but speaking at what could be a church, school, or some smaller stage, creating an impression of a semiformal situation. We appear to come quite close to the famous Martin Luther King Jr., where he is standing seemingly in the act of speaking with his hand raised, the palm open and turned towards his face. He is looking young and happy, smiling and looking straight into the camera meeting our gaze, creating a feeling of a person who is directly interacting with us in a positive happy and non-confrontational way. The engaging use of images is in contrast with the quite distanced and objective informative style of the verbal modes as Camilla uses them. The last part of the presentation, just as in the essay, is Camilla’s own thoughts on the issue. In the verbal modes Camilla moves in a linear fashion from a general objective position at the beginning of the audiovisual presentation, to her subjective position at the end delivered in an informative manner.

In his *essay* Daniel almost immediately engages the reader as a present, but invisible speaking partner, effectively building a relation to his audience. Even in passages that are mostly informative he uses a talkative relational style, which is noticeable in expressions, such as, "the colonists didn’t know how", or "slaves wasn’t that important", where the use of contractions (didn’t, wasn’t) is a marker of informal or spoken language. Daniel also uses emotive words and expressions, for example, "after a long and horrible road", which serve to engage the readers feelings. Daniel includes the reader in his subjective positioning with the use of ‘us’, and ‘we’ and, distances himself (and the reader) in the use of ‘they’ for colonists. The body of the text is more informative, but with relational markers, while in the final paragraphs Daniel clearly expresses his subjective position (horror), and includes the reader in this with, "no one can change history, the only thing that we can” [do], and he concludes with hoping we can learn from our mistakes and change the future, clearly including the reader in his subjective position with the use of ‘we’.

The interpersonal metafunction in Daniel’s *audiovisual presentation* is even more pronounced. The presentation has an air of conversation starting with "hello everybody”. Expressions such as, "you see", (‘you’ is used as a mode of address all through the audiovisual presentation), serves to directly involve the audience/reader with Daniel’s subject and reasoning. There are more emotive words used in the audiovisual presentation than in the essay, also embedded in the parts of the audiovisual presentation that give information. This way Daniel keeps his audience engaged at a personal and
emotional level in every passage of his presentation. The images enhance this effect as Daniel has chosen images with a high emotional load, slaves being whipped, antagonistic soldiers face to face, clasping hands of different colour, and flags and maps, which are symbols for nations and come with emotional feelings that can vary for different people but which are nevertheless there.

In her essay Emma uses an informative but engaging style. Embedded in information are turns of phrase where Emma’s own voice or thoughts shine through. "In theory, separate but equal sounded quite equal and fair, but in reality it was everything but". The last part of the essay is markedly subjective where Emma clearly states her thoughts and opinions. Emma moves from a general informative and partly objective position, in the first two-thirds of the essay, to her subjective position at the end.

The opening frame in Emma’s audiovisual presentation has a black fist appear in a flash, adding an element of movement to the otherwise still image. The burning of the fist, as a transition to the next slide, is also highly emotive. Fire carries meaning in many ways. Exactly what Emma thought here we can only guess at, but that fire is associated with heat should be a safe claim. The burning fist, that marks the transition to the slide where Emma focuses on segregation, sets the scene so to speak providing an air of heated fight. The next two images we are shown include one of Lincoln speaking to people sitting around his feet, both black and white and some in postures of supplication. It is an image that can make us associate with images of Jesus talking to the people, presenting Lincoln as a saviour. The photograph next to the image of Lincoln shows a black man drinking water where two water fountains are side by side, but separated after race. The fountain for white people is bigger, better and nicer. This is an image that evokes reaction, as it is so blatantly unequal. The next slide shows three photos of Rosa Parks, Malcolm X and Martin Luther King Jr. respectively. Rosa Parks is looking out the window riding a bus. This makes the viewer of the image a spectator, creating a distance to her. Malcolm X appears more approachable, not looking into the camera, but smiling looking at someone just outside the picture. Martin Luther King Jr. is looking into the camera, but still not meeting our gaze. This creates a distance. The microphones also contribute to a feeling of distance. He is fenced off from the viewer, while Malcolm X in the photo appears more approachable, as if he is just about to turn to the camera and start a conversation. The photo gives a relaxed, almost intimate feeling, creating a relationship between the image and reader of the audiovisual presentation.

In Fanny’s essay we can see that Fanny uses a distanced and informative style. Fanny’s subjective position can be discerned in the final paragraphs where she uses expressions such as "I think”, and where she is giving her own opinions. She is here moving in a linear fashion from a general informative manner at the beginning of the text to her subjective position at the end.

In Fanny’s audiovisual presentation there is the added image and voice clip to consider, and placement and gaze. The photograph shows a group of men in what can be interpreted as a traditional aboriginal ceremony. The focus in the image is the young boy who is looking to the side. No person in the image is looking into the camera, which creates a feeling of being a distanced watcher. The feeling of the image in this way becomes more objective than if the people in the image had looked into the camera. However, the image is not objective in how it depicts native Australians with body paint and in loin-cloths. These are people putting on a show for the photographer, and we the audience are being staged. The choice of this image, rather than other images of aboriginal people taking part in modern society, sends a message of a people apart, different, not quite modern, and these are people looking happy, content not persecuted or abused as is the message of the verbal modes.
Greta’s essay uses a subjective, emotionally engaging informative style. In the last part of the essay Greta gives her own thoughts on the issue where she clearly emotionally distances herself from the practices she has been describing. There is a linear movement or progression from a more informative beginning of the text to a subjectively emotionally flavoured conclusion at the end.

In Greta’s audiovisual presentation there are added elements for images to consider. The topmost image shows a close up of baby looking off camera, but we still see they eyes clearly. The gaze is directed at someone, or something, to the side of the woman holding the child who is looking sad or maybe frightened. The focus of the image is the baby’s face. Together with the verbal message the image creates an emotional effect. This child evokes a feeling of someone that needs to be protected, nurtured and sheltered. The (black) woman holding the baby appears loving and protective. The narration is telling us about forcefully removing children and abusing them. Looking at this image creates an emotional hook, a feeling of wrongdoing reinforcing Greta’s spoken message and reflections. The colour in the image serves to further emphasise the emotional message. The other image below is a black-and-white photograph. It is a landscape image with one person in it, but we cannot see the face clearly. The image is distanced. This photograph is informative in character, and does not create the same emotional effect as the photograph of the baby.

4.2.3 The textual analysis

For seeing how the textual metafunction is at work in essay and audiovisual presentations, sequencing, composition, and how coherence and cohesion are created are considered. The written text is framed by the borders of the ’paper’. In the essays writing is the dominant mode, and the central means of conveying meaning, and the sequential logic of writing supplies the principle for organising and ordering the content material (Kress, 2010). The reading order follows the Western norm, from left to right and top to bottom. The general writing instruction the students were given (appendix 2) supplies a set order of text construction with a title and introductory paragraph, a body of text with several paragraphs and a concluding paragraph. All the students use this essay structure where each paragraph is one logical content unit. The audiovisual presentations are framed by the border of the slide(s) and the border of images, but also bullet points, animations, and spatial and temporal gaps (pauses), and in the mode of speech pitch, is used to mark idea unit, while in the written mode, the full stop is used to mark the end of a sentence (Kress, 2010). The students use visual and verbal modes in different combinations. There was no general instruction for how to construct the audiovisual text as there was for the written text, and the students have solved the construction of their audiovisual presentations in different ways.

Ada uses both content and time to sequence her essay, following the ’given’ order from the instructions of what content to cover, and a back and forth motion over time, starting in the mid-20th century dropping back to the 19th century, forward again to the mid-20th century, to contemporary Sweden, and finally back to before 1964. For sequencing after content there is a linear movement in the text, but for time the movement is more of a pendulum, back and forth. This creates logic and order, but also creates implicit comparison over time. The temporal sequencing starts in the 1960’s moving back in time to 1876 forward to 1913, 1950’s, 1996, 2005 and finally today. There is also a geographical sequencing, starting in the USA and ending in Sweden. Rosa Parks and the Montgomery Bus Boycott in 1955 is indicated as the starting point of the civil rights movement. When comparing to civil rights in Sweden Ada switches from using the past tense to the present tense. By using the present tense, ”in Sweden it’s the state that needs to ensure that people have there rights”, Ada indicates that she is giving contemporary information. No other markers for time are given. The
structure and layout of the essay has a clear logic. The subheadings and dividing lines make it easy to see how the text is framed (divided), and which part of the text is about what. The reading order is, of course, from left to right and top to bottom. The structure is clear including an introduction, a body of text with paragraphs and a conclusion. No images are used. The sectioning of the text with the use of bullet points in the introductions, and subheadings for content sections makes the logic clear, but interrupts the flow of the text, creating clearly delimited parts of the text that are not linked from one to the other.

As to the textual metafunction in Ada’s audiovisual presentation, and how she uses sequencing, composition, and creates coherence and cohesion, there is in all slides a principle of sequential logic for organising and ordering the content material expressed through verbal modes (speech and writing), while the images are organised in a circular fashion, or a pendulum movement form civil rights to segregation back to civil rights. The order of the how the essay is constructed can be seen as reflected in the construction of the audiovisual presentation that has a title, paragraphs, sentences et cetera, but with the added complement of images where the visual modes can be seen as following a comparable linear order in that the first image illustrates the title (rather than the spoken narrative), the second and third slides have images that reflect the content of those slides, which in turn are ordered linearly. However, the first slide is not quite one logical content unit, as the image reflects the title of the presentation, but is not in line with the following narrative, while the other two slides are a logical content unit each. Temporally the sequencing moves back and forth from 1876 to 1965, 1945 to 1963, 1964, 1968, to 1913, finally landing in 1955. The principles of sequencing in both essay and audiovisual presentation Ada uses are based on content, but in the presentation Ada has left the structure supplied by the instructions of the assignment, and stays at the level of giving information about civil right with a bit of background, which is the first part of the task the students were given. The reading order is from top bottom and left and right in parallel. Writing is read from left to right and top to bottom and images are read simultaneously with verbal modes. Topic-wise Ada talks first about Martin Luther King Jr., which is the topmost image, hence the implied reading order would be top to bottom, but the lower image of Rosa Parks shows her smiling face and draws the eye. The effect is that the slide is read more or less simultaneously. Martin Luther King Jr. is given more dominance in the verbal modes, but the photo of Rosa Parks is more salient. For the audiovisual text, Ada has to create her own structure without prior instructions for how to sequence or divide her audiovisual text. She then has to fall back on other resources and models for audiovisual text. In the audiovisual presentation image and writing are used both sequentially, as in the first slide, and in parallel, as in the next two slides. Verbal modes (speech and writing) and image are used as equal means of conveying meaning. It is neither the logic of writing nor that of image that dominates. Instead is it layout where logic is founded on the logic of space. In the first slide writing is placed over the image. The functional task for the image is not just as an illustration, but as fully carrying information. For the first slide the image can be seen as spatially embedded in the sequential order of writing. Ontologically writing and image here have equal standing in representing knowledge. The heading suggests a spatial arrangement leaning of the sequential order of writing, but then below image and writing are spatially placed in parallel. The presentation has at one level a sequentiality, which is as fixed as that of the written essay. The recorded format is as sequential in time and in the order of the slides. While the spoken commentary is as sequential as the written essay, the multimodal format also allows for less sequential reading of the slides which encourage parallel reading. The presentation as such is a continuous form of parallel reading where layout, image and writing co-occur with the spoken narrative. The layout of the slide combining image, writing, colour (typeface) facilitates a parallel visual reading a visual movement of back and forth.
Camilla’s essay follows a clear logic of constructing text, where the instruction for how to construct an essay is clearly discernible. The structure and layout of the text has a clear logic. The subheading and dividing lines make it visually clear, and easy to see how the text is framed, and which part of the text is about what. Camilla uses short but succinct paragraphs. Often only a few sentences long. The reading order follows the Western norm from left to right, and top to bottom. Camilla’s principles of sequencing are primarily based on content. She uses the general writing instruction for how to construct an essay, and the content instruction for the assignment. Camilla follows the instructions faithfully, contentwise with background and information about civil rights in the US, comparing with Sweden, reflecting on the issue(s), and including sources, and in structure as she has a title, and introduction, a body of text, and a conclusion. There is also an order of geographical sequencing. We start in the US, continue to Sweden, and end in a general comment which can be interpreted to apply globally. There is temporal sequencing starting with the 1950s and 1960s, and then concluding in contemporary society. Camilla uses chronological sequencing, apart from mentioning 1955 before 1954. Camilla’s text is linear in its construction for both content and time creating a clear logic.

Camilla starts her audiovisual presentation with introducing her topic, and outlining the content. The logic is related to how she has constructed her essay while no carbon copy. The use of the written mode in the audiovisual presentation creates a (visual) structure, and has the effect of creating a clear sequencing of the presentation. The order of slides serves the same function as that of paragraphs in her essay. Camilla includes an introduction, body of content (with several slides), and logical subunits in these slides such a text items (headings and bullet points) and images. Each slide is one logical unit of content. The temporal and geographical sequencing is in line with how the essay is constructed starting in the mid-20th century, concluding with contemporary society, and moving from the USA to Sweden. The verbal and visual modes mostly reinforce the subject dealt with. The tone of verbal and visual elements is neutral and informative. The pale beige-yellow background gives association of old yellowed paper. The grey text colour contributes with a soft impression. The audiovisual text is structured in seven separate slides. The slides are then substructured by using headings subheadings (or bullet points), and textual animations following the spoken contents sequential order and by the topic of the images. For the audiovisual text Camilla largely follows the order or the written text, where one or a few paragraphs correspond to one slide. Where there is more than one paragraph linked to a slide these follow the subtextual unit of the slide (bullet points), and Camilla is clearly using her knowledge of how to construct written text for how to structure her audiovisual text. The use of subheadings suggests a spatial arrangement leaning of the sequential order of writing, but then below the subheadings images and writing are spatially placed in parallel. Camilla’s principles of sequencing in the audiovisual presentation are primarily based on content, just as in her essay. Camilla follows the order given the instructions, which she does in the essay as well. The temporal sequencing follows the same logic as in the essay moving over the last seventy years in a linear movement. The same is true for geography starting in the USA, concluding with Sweden and general reflections, which could be interpreted as global in intent. Camilla’s audiovisual text uses a linear logic in its construction as to structure, content and temporality. In the audiovisual presentation verbal modes (speech and writing) and image have equal standing when Camilla is representing knowledge (Kress, 2010, p.143). Both the written and audiovisual text are brief and succinct in character. The written mode is dominant in the essay, but verbal modes (speech and writing) also dominate parts of the audiovisual presentation where there are no images used. In both the essay and the audiovisual presentation Camilla points to a situation that has become better, but where some groups of people in reality still face discrimination. Both Camilla’s written and audiovisual texts use a linear logic as to structure, content and temporality.
Daniel’s essay follows the set order of text construction, supplied in the general writing instruction the students were given. There is a title and introductory paragraph, a body of text with several paragraphs, and a concluding paragraph. Daniel skips the comparison to Sweden, but otherwise follows the order of the information given in the instruction. Daniel does not include a list of sources at the end of his text. (He handed in a list of sources separately). He uses paragraphs that are clear-cut logical content units. One paragraph to introduce the topic, the next is about slavery, the third paragraph deals with the Civil War and so on. The reading order follows the Western norm from left to right, top to bottom. The principles of sequencing are based on content and temporality with civil rights as a contemporary starting point, going back to the 17th century and slavery, and from there moving forward to the 18th and 19th centuries, the Civil War, followed through to the 20th century and the civil rights movement, and finally landing in our shared now, and Daniel’s reflections.

In the audiovisual presentation Daniel starts with introducing the audience to the topic, saying that he is going to talk about civil rights in the USA today, (but then he talks mostly about the past). There is a clear correlation between the essay and the presentation, but for both the written and audiovisual texts there are areas that are not dealt with in the other representation of knowledge. There is however a (linear) logic that is related to that of the essays, where the slides function as logical content units much the same way that paragraphs do in Daniels essay, so that the first slide is an introduction, the second deals with slavery, the third with the Civil War, et cetera. However in the presentation Daniel includes a comparison to Sweden and ties this to his conclusion. Daniel ends with using a question for us to think about, as a rhetorical device. The temporal sequencing correlates to that of the essay moving in the same manner from a contemporary starting point to the 17th century to the mid-20th century in the USA, to switching content area, country and backtracking to the early 20th century and the Swedish women’s right to vote. The white background in the slides hints to the printed page. The white is a cold but neutral colour. The choice of photographs reinforce the topic of each section. The images add an emotive element to the presentation, which is less apparent in the speech. The verbal and visual modes reinforce the verbal modes and the subject dealt with. The tone of verbal modes are neutral and informative, while the tone of the visual modes is emotive, but can also be informative, such as the use of maps. Daniel’s audiovisual text is structured with seven separate slides. These slides can then be substructured by the use of images and text items. Here images function more as substructuring items than do written items. However they co-vary. Images, text items and speech follow a sequential order and a Western reading order. The slide visually delimits the area we see, and frames each section of the presentation. We have the borders of the slide, and the borders of the images that frame the visual elements. There are spatial gaps between images, which help frame and highlight. In Daniel’s speech there are pauses, temporal gaps that frame both slides and sections of content. At an overall level the audiovisual presentation follows the structure of the written essay. At a detailed level Daniel uses other examples and puts focus on areas only briefly mentioned in the essay. Daniel is moving beyond the written text in his presentation. He uses spatial arrangements, which are sequential but not in the linear order of writing. Images are spatially placed in parallel, or images are placed above or in one case around text items. In the audiovisual presentation image and writing are used both sequentially in the first slide, and in parallel in slides two and three. Verbal modes (speech and writing) and image are used as equal means of conveying meaning. It is neither the logic of writing nor that of image that dominates. Instead is it layout, which is founded on the logic of space. For the first slide writing is placed over the image. The functional task for the image is more than just illustration. For the first slide the image can be seen as spatially embedded in the sequenced order of writing. In Daniel’s presentation speech and image have equal standing in representing knowledge, while writing only serves as a contributory mode,
Emma’s essay has a clear structure using norms and logic for constructing text divided using layout (separated by blank lines) as well as content. Emma uses a title, one subtitle, and at the end she includes a list of sources. Emma’s principles of sequencing are based on content and we can see both the general writing instruction for how to construct an essay, and the content instruction to the assignment (appendix 2) in how the essay is sequenced, since Emma follows the logical order of information given in the instruction. There is a temporal sequencing starting in the 18th century, moving forward to the 19th, up to the 20th century, and finally ending in our contemporary times. In the essay writing is the dominant mode, although there is one image used (the same fist that Emma uses in the first slide in the presentation).

Emma starts her audiovisual presentation with greeting her audience. She uses visual elements to link, and transition, from one part of the audiovisual text to the next, as well as verbal linking. The olive green background is a calm colour. The choice of photographs exemplify the point Emma is making here. The verbal and visual modes reinforce the subject dealt with. The tone of verbal elements is mostly neutral and informative, while the images are emotive rather than purely informative. The animations Emma uses are synched with her speech, and the content being dealt with, reinforcing her message. The audiovisual text is structured by four separate slides. These are fewer than the paragraphs in Emma’s essay, but for each slide there are several paragraphs in the essay which can logically be seen as related. The slides are substructured by using textual animations following the sequential order of the spoken content, and by the topic of the images. Images and transitions also use animations. For the audiovisual text Emma largely follows the order of the written text in the essay, but were one slide encompasses content from more than one paragraph. The order is however largely the same. The reading order is from top bottom, and left and right, in parallel. Writing is read from left to right and top-to-bottom, and the images are read simultaneously with writing. The effect is that the slide is read after the sequential structuring that animations bring. Emma is clearly using her knowledge of written text, as well as the order in the instruction, for how to structure her audiovisual text. The use of headings suggests a spatial arrangement leaning of the sequential order of writing, but then below images and writing can be placed in parallel, as is in the second slide. Emma’s principles of sequencing in the audiovisual presentation are based on content and temporality, using the same linear temporal logic of as in the essay, moving form a point in the past forward to contemporary society. In Emma’s audiovisual presentation verbal and visual modes have equal standing in the task of making meaning and representing knowledge. Emma’s use of animations, and how she times these, serve to reinforcing the meaning she is making, adding a layer of meaning, as she is representing her knowledge in an audiovisual medium.

Fanny’s essay uses a clear and standard logic of constructing text, following the instructions supplied. There is both a title, a lead, an introduction, body of the text, with several paragraphs as logical subunits, a conclusion, and a list of sources at the end. The structure can be associated with the structure of a news article (which is something the students have previously worked with). The lead is marked in bold print. The lead and dividing lines make it visually clear and easy to see how the text is segmented, and which part of the text is about what. Fanny uses short paragraphs, often only a few sentences long. Fanny’s principles of sequencing are based on content, the general writing instruction, and the content instruction to the assignment. The temporal sequencing starts with our near past, goes back to the period 1890-1970, and then moves forward again to today, and geographically there a linear movement from Australia to Sweden. There is a linear structure for content but time is used in a circular movement.
In the audiovisual presentation Fanny follows the structure of the first part of her essay faithfully, but cutting it very short. The title of the presentation, “multicultural society”, is not reflected in the content in any modes, not in image, text or directly in speech. The choice of photograph is a glance at aboriginal culture, but does not reflect the issue of ‘stolen children’, which is the content of the information we are given through the verbal modes. It does however inform us of one facet of aboriginal culture. The tone of verbal and visual elements is informative. There is only one slide and Fanny appears to be reading from the first part of her essay, and follows the structure in the first paragraphs. The slide is read after the focus of the image, which is the young boy in the centre. It is hard to determine where the eye lands first, but the image and the written text would be read almost simultaneously. The written text is in bold type and large, placed at the very centre of the image above the boy who is in focus. Writing and image are visually balanced. Verbal and visual modes have equal standing in the task of making meaning and representing knowledge in the audiovisual presentation.

Greta’s essay uses both a title, a subheading, and then further substructuring with bullet points and subheadings. Greta’s introduction to the essay may not be conventional in form, but serves the same function. There is a body of text, although substructured with several paragraphs as logical subunits, a conclusion, and a list of sources at the end. Although Greta has clear instructions for how to construct the essay she chooses to deviate from the general writing instruction, and make her written representation in a variation of this form, but the structure and layout of the text has a clear logic. The use of subheadings in the form of bullet points, and dividing lines, make it visually easy to see how the text is framed, and which part of the text is about what. At the same time this structure interrupts the text flow. Greta uses short but succinct paragraphs, often only a few sentences long. The reading order is from left to right and top to bottom. The subheadings create stops along the way, where the eye can rest and see what the next few lines will be about. In the essay writing is the dominant mode with writing as the central means of conveying meaning.

Greta’s audiovisual presentation starts with stating the topic of the presentation, indicating the content to come. There is a clear logic that is related to how she has constructed her essay. The use of the written mode in the audiovisual presentation creates a visual structure, and has the effect of creating a clear sequencing of the presentation, much the same as the use of subheadings in her essay. The narrative, with each bullet point corresponding to one paragraph in the essay, appears to piggy-back on the logical construction of the essay or vice versa, contributing logical subunits in these slides such as text items (headings and bullet points) and images. Each bullet point supplies one logical unit on content. Greta includes an introduction, body of content (two slides but with text animations), and a conclusion where she states her feelings and opinion. The temporal and geographical sequencing is in line with how the essay is constructed, starting in the early 19th century, and concluding with contemporary society and moving from the USA to Sweden. The black background gives a stark impression. The choice of photographs represent the two different native populations mentioned in the presentation. Speech and writing appears simultaneously where the writing reinforces the content of the speech. The tone of verbal and visual elements is both informative and emotive. The audiovisual text is structured by the two slides, and the use of substructuring text animations (subheadings in the form of bullet points). The textual animations follow the sequential order of the spoken content. For structure in the audiovisual presentation, Greta largely follows the order of her written text, and uses the same subheadings in both text types (bullet points). Greta is clearly using the same logic for structuring both the essay and the audiovisual presentation. The use of headings suggests a spatial arrangement leaning of the sequential order of writing, but at the same time images and writing are spatially placed in parallel, so that writing and image are read simultaneously and in parallel. Greta’s
principles of sequencing in the audiovisual presentation are primarily based on content, just as in her essay. Camilla follows the order given in the instructions, which she does in the essay as well, and which is reflected in how the sub-headings are organised. The temporal sequencing follows the same logic as in the essay moving over a hundred and fifty years in a linear movement. The same is true for geography starting in Australia concluding with to Sweden. Greta’s audiovisual text uses a linear logic in its construction as to structure, content and temporality. In the audiovisual presentation verbal modes (speech and writing) and image have equal standing when Greta is representing knowledge.

4.2.4 Differences and similarities in the written and audiovisual texts

There are differences and similarities in ideational meaning, as reflected in what content the students have chosen to include when shaping their knowledge and making meaning, but the most common type of content in both essays and audiovisual presentations was re-presenting facts, or processes of classification. Ada, Camilla, Daniel and Emma, chose to work with the USA and the black civil rights movement in their essays and audiovisual presentations. However, they differed in focus. All four students targeted mistreatment and discrimination in some way. Ada focused on legal structures, segregation and race, Camilla and Emma on the black civil rights movement in the mid-20th century and its background, while Daniel’s focus is placed earlier in history, on slavery and the Civil War as leading up to the modern civil rights movement. Ada and Camilla emphasise that discrimination still exists. Fanny and Greta chose to work with Australia’s indigenous population(s), and both students focus on the issue of ‘the stolen children’, the official policy of removing indigenous children from their parents and communities, and both students also focus on the abuse and mistreatment of these children. There were differences in how the students referred to specific people, or not, in their essays and audiovisual presentations. Ada, Camilla, Daniel and Emma all mention Martin Luther King Jr., or use him a symbol for the American black civil rights movement. Ada, Camilla and Emma also take up Rosa Parks and the Montgomery bus boycott as examples and as something important in the civil rights movement. Emma is the only one who also mentions Malcolm X. Both Ada and Camilla refer to Mahatma Gandhi as being an inspiration for Martin Luther King Jr. and a non-violent approach. Greta and Ada use quotes from ‘regular’ people who had experienced segregation or been ‘stolen’ as a child. Greta and Fanny both include the official apology of former Australian Prime Minister Kevin Rudd to stolen children and their relatives. It was a requirement in the assignment to compare to Sweden. Ada compares issues of legal rights to Sweden at a societal and institutional level, and she compares to topical issues, such as the recent influx of refugees and existing racism, but she only does this in her written text and not in the audiovisual text. Camilla does not include any comparison to Sweden in her audiovisual presentation either. In the essay Camilla takes up black people in Sweden. Daniel does the opposite, no mention of Sweden in his written text. In the audiovisual presentation he compares civil rights issues of black Americans to the struggle for women’s rights in Sweden, but does not develop this. Daniel is the student who places his focus furthest back in history to explain a contemporary situation. Emma, Fanny and Greta take up the influence from Nazi ideologies on Swedish society before (and during) WWII. Emma does this in a general way, while Greta and Fanny both highlight the Sami as being subject to racial prejudice in Sweden during that period. Ada is putting what she has learnt about the black civil rights movement in the USA in relations to what she knows about contemporary Sweden, her world and issues of racism, power and discrimination. Camilla is relating what she knows about the US black civil rights movement to her knowledge of a contemporary Swedish situation. Daniels explains the slavery systems indicating the scope of the system and the conflicts such as the Civil War. He is developing an understanding of how all this could have happened, expressing hope that things could have been different if people had understood what slavery
would lead to. The sense Daniel’s two texts bring is that it was bad, but that things are all better now, while Emma points out that today all citizens are equal in the eyes of the law, both in the USA and in Sweden, but that the reality is something else. Fanny is re-presenting knowledge about aboriginal children being taken from their families, and that the black population was considered people of less worth than the white population, and that Australian society had a policy with the aim to remove the ‘black’ form the population. Greta expresses horror and clearly distances herself from any of the thoughts or ideas, which led up to the policies leading to the stolen generation in Australia, and discrimination of the Sami in Sweden. Classifying processes (‘just’ giving information) dominated in Ada’s and Fanny’s essays, while for Daniel, Camilla, Emma and Greta classifying and analysing processes were evenly represented in the essays. The use of images means that there can be several processes (Kress & van Leeuwen, 2006) active simultaneously when visual modes co-occur with verbal modes. Through the use of images in the students’ audiovisual presentations classifying and/or analytical, and symbolic processes are active simultaneously, and thus evenly distributed and the images also contribute symbolical processes. The use of classifying and analytical processes in the students’ audiovisual presentations closely follows how they constructed their essays, and for Camilla, Daniel, Emma and Greta symbolic processes are active to at least the same extent that the analytical and classifying processes are. Ada’s and Fanny’s audiovisual presentations are less complex. From this it can be concluded that Ada and Fanny are mostly retelling facts and information, while Daniel, Camilla, Emma and Greta are working at a more analytical level. There are similarities in frequently used words in the students’ representations of knowledge, these include ‘people’, ‘rights’, ‘black’ and ‘white’ civil rights’, ‘different’, ’equal’ (see table 5). All six students frequently use words that describe colour, race, or ethnicity. Ada uses words for colour most, and Greta least and the use varies in focus. Ada for example uses the word ‘white’ more than ‘black’. Daniel is the only student who frequently uses the words slave or slavery, but on the other hand he is the only students who specifically focuses on the slavery system. Fanny and Greta also frequently use the words ‘children’ and ’stolen’. For all the students the word ‘people’ was used often in both written and audiovisual texts, indications of identification processes, as we are all people and can identify with other people. Using the word ‘people’ has the effect of humanising and lessening the readers distance to the subject. We are all ‘people’ in one way or another.

**Table 5. Central concepts used by students (after frequency), reflecting ideational meaning.**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Essay</th>
<th>Audiovisual presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ada</td>
<td>people</td>
<td>people, white</td>
</tr>
<tr>
<td></td>
<td>rights</td>
<td>black</td>
</tr>
<tr>
<td></td>
<td>civil, white, black</td>
<td>Martin Luther King Jr., Jim Crow laws, separate</td>
</tr>
<tr>
<td>Camilla</td>
<td>movement</td>
<td>movement</td>
</tr>
<tr>
<td></td>
<td>rights, people, black</td>
<td>rights, people, black</td>
</tr>
<tr>
<td></td>
<td>civil, separate</td>
<td>civil, started</td>
</tr>
<tr>
<td>Student</td>
<td>Key Terms</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Daniel</td>
<td>civil rights, people, America, slavery, war, civil, rights, slavery, war, people, black, America</td>
<td></td>
</tr>
<tr>
<td>Emma</td>
<td>people, white, different, equal, rights, civil rights, people, separate, law, black, different, segregation, services</td>
<td></td>
</tr>
<tr>
<td>Fanny</td>
<td>generations, stolen, Australia, people, aboriginal, families, Australian, children, society, started</td>
<td></td>
</tr>
<tr>
<td>Greta</td>
<td>children, people, white, aboriginal, children, people, white, aboriginal</td>
<td></td>
</tr>
</tbody>
</table>

The *interpersonal metafunction* is reflected in how the students engage the reader by the use of subjective positioning and style, both in the essays and audiovisual presentations. Daniel is the student who uses the most direct and personal mode of address. Daniel essay uses a manner of spoken conversation with a silent speaking partner, which is effective in building a relation to his reader. The audiovisual presentation is also highly engaging in that Daniel speaks directly to the listener, and he keeps the audience engaged at a personal and emotional level all through his audiovisual presentation. Fanny is the student found at the opposite position. Fanny is strictly informational and objective in style, both in essay and audiovisual presentation. Ada stays at a neutral and informative level in her essay, but at the end the tone and mode of address changes, directly relating to the reader and speaking to our emotions. Camilla uses an objective style in her essay as well. In Camilla’s audiovisual presentation the emotive and engaging use of images is in contrast with the distanced and objective informative style in the verbal modes. Emma’s and Greta’s style is also informative and engaging, but they both end their essays at a highly subjective level. Emma’s audiovisual presentation affords more means of expressing emotive meaning than the written mode in her essay, such as the animation of a black fist, which later burns to ashes and ‘disappears’ in the transition from one slide to another. The images add layers of emotive load to her audiovisual presentation compared to the already engaging text. The relationship between the visual parts of the text is reflected in the narration, where the focus both in length, dominance and emotional load is placed on the topic of aboriginal children. The Sami, in comparison, are mentioned in a more informative manner and with less detail. There is a general pattern in the students’ essays and audiovisual presentations where they move from an informative style to a more subjective position at the end, which is a reflection of the construction of the assignment where the students are asked to inform, compare and reflect. Tone or style is also apparent in the use of colour. For example Camilla uses a pale ‘old yellowed paper’ background, grey is used for written text, which gives a soft impression, while Daniel uses a white background, a cold but neutral colour. Emma uses an olive green template that is calm and soothing, while Ada and Greta use a black background that gives a stark but neutral impression. The use of images in the audiovisual
presentations adds interesting levels of interpersonal meaning. The images speak far beyond the words used. For example white people, in the images the students have chosen, have a more confident and confrontational body language, they look directly into the camera while the black people look down or to the side. We can guess that white men and women could afford to be more confrontational, and that they risked less by taking a stand than black people. This is something we can see in images that Ada, Camilla, Daniel, Emma and Greta use. Emma includes an image of Lincoln speaking to a group of black people looking up at him in supplication. This is an image with strong religious overtones and associations to the idea of a saviour. Fanny’s use of image makes a break from the pattern of the other students. For all other students the images are in line with the content of the verbal modes adding to, or reinforcing the verbal message, or the other way round, where the spoken message is a reflection of the image used. Visual and verbal modes co-vary and together reflect the same content. Fanny uses a photo that is not in line with the content of the spoken narration. The image speaks to us, but about other things, sending a message of native Australians as different, not modern, and happy, while Fanny is talking about mistreated people and children.

The textual metafunction is at work in how coherence and cohesion are created. Ada, Camilla, Daniel, Emma, Fanny and Greta all use principles of sequencing that are in part based on temporality, as well as content. Ada uses both content and time to sequence her narration in both essay and audiovisual presentation. The content follows a linear sequential order, while Ada uses a pendulum movement of back and forth for time. This has in the essay a double effect of creating coherence and cohesion but also a subtle implied comparison over time. Fanny’s text is linear in both structure and content but circular as to temporality. The principles for sequencing used by Camilla and Emma are primarily based on content and chronological time. Camilla, Emma, Daniel, structure their essays in the conventional style of school essay with flowing text and sectioned with paragraphs, but with no use of subheadings. Fanny models her text after the style of a news article including both title and a lead. She is the only student to do so. The lead is marked in bold print, so in this written text there is an element of layout to consider as well. More than in the other students’ essays, possibly with the exception of Emma who included an image. Greta structures her essay using both subheadings and bullet points and follows a clear logic, while deviating from the regular essay form of flowing text, with her use of subheadings in the form of bullet points. Ada also uses bullet points which create distinctly delimited parts of the text. All the students use blank line between paragraphs creating a visually clear structure of the written texts. Camilla, Emma and Greta structure their audiovisual texts with slides that in turn are ‘substructured’ with the use subheadings and textual animations. These in turn follow the sequential order of the spoken narration and the topic of images and illustrations. In Daniel’s audiovisual presentation slides are substructured by the use of images and text items, where photographs reinforce the meaning made. In Greta’s audiovisual presentation the order of text animations serves the same function as that of subheadings in her essay. Fanny only uses one image and one slide.

The students’ essays follow a clear logic of constructing text, where both the instruction for how to construct an essay, and the specific instruction for what parts to include in the assignment, are clearly discernible. For several of the students, Ada, Camilla and Greta, the construction of the essays is reflected in the construction of the audiovisual presentation, where a slide more or less corresponds to a paragraph in an essay, with the added complement of images, where the visual modes can be seen as following a comparable linear order in the narratives. Fanny appears to be reading directly from the first part of her essay, and there is only one image. For the audiovisual presentations the students had to create their own structures without prior instructions for how to sequence or divide the audiovisual
texts. The students then fall back on other resources and models for audiovisual text, and one such resource is the order for how to construct an essay with introduction, a body of text and a conclusion. This is something students have done many times in school and are familiar with. A difference between the written and audiovisual text is found in reading order. The essays are read from left to right and top to bottom, in a linear and sequential order, and the audiovisual presentations are completely linear as to temporality, one unit of time after the next, one slide after the other. Some students use animations for transitions and linking, timing these with the narration in verbal and visual modes, which reinforces and adds a layer to the meaning being made. The effect is also that a slide is read after the sequential structuring that animations bring. Images are read in parallel to the sequential order of the verbal modes of speech and writing. The reading order of the images can be from top to bottom, or left to right, depending on how the student chooses to place the images in the slide. The images in themselves can then be read in, and from, different directions. This adds levels of complexity to sequencing, which is not present in texts that use the written mode. Writing and image have equal standing in representing knowledge in the audiovisual representations. This is a reading in mutual interaction of several modes, writing, speech, image, layout, and in effect both sequential and parallel but at different levels. One student who stands out here is Fanny, who uses a single image, and one that is slightly ‘off topic’. Verbal and visual modes can still be seen as having equal standing at a purely ontological level. The image used conveys many meanings at many levels, just not quite in line with the verbal modes, but this in itself becomes part of the knowledge Fanny is giving shape to.

4.3 Analysis 2

The second analysis takes its starting point from the second research question, what are the affordances of written essays compared to audiovisual presentations for representing knowledge about civil rights, and looks at differences between the written and audiovisual representations of knowledge.

For Ada there is a striking difference between the essay and the audiovisual presentation, in the added information value of the three images used in the presentation. Although Ada is including more content and more areas of knowledge is represented in her essay, such a comparison with Sweden and her own thoughts (however brief), the use of images in the audiovisual presentation adds levels of emotion and shows us directly what segregation could look like. These images carry messages at an emotive level that Ada’s use of verbal modes does not. The audiovisual text affords the use of more modes being active simultaneously, text, speech, and image, where the images and the visual modes carry more information compared to the verbal modes per idea unit. The major difference between Ada’s essay and audiovisual presentation is that the visual modes allow for more information, including emotion, to be transmitted in the audiovisual text, which compensates to a certain degree for the somewhat rudimentary content in the verbal modes.

When looking at affordances and constraints when Camilla is making meaning and representing knowledge, the major difference between the two media of representation (Camilla’s essay and audiovisual presentation) is that the images in co-occurring modes allow for symbolical processes to be active simultaneously with classifying and/or analytical processes in the audiovisual text, which is not the case for in the written text where the linear sequentiality and the limited number of modes active allow for less simultaneous activity and meaning making. A striking difference between the two media of representation, when Camilla is making meaning and representing her knowledge in written and audiovisual text, is that the images in co-occurring modes allow for subjective positioning to occur.
at different levels simultaneously through the juxtapositioned use of emotive images, and the (more) neutral informative use of verbal modes.

Daniel is working at an analytical level in both the media of essay and audiovisual presentation. It becomes apparent when looking at what processes are active in the written text compared to the audiovisual text, that the use of images affords the possibility of including more symbolical elements, as well as having these elements active simultaneously, as the modes speech, writing and image are active at the same time. The audiovisual text not only offers more simultaneous channels of information (and hence more information), but adds qualitative elements of communication, and affords Daniel the means to express his knowledge at a deeper level. Daniel fully uses the affordances of the audiovisual medium, which is clearly reflected in how Daniel constructs interpersonal meaning. The visual modes not only co-variate with the verbal modes, but enhance the message and the meaning Daniel is making, resulting in meaning making that goes deeper at an emotional level, and in this way also becomes an (implicit) argument against all mistreatment of people no matter when or where.

Emma’s two texts clearly show the difference the added possibilities images and animations give. In the essay, the idea units come one at a time (although Emma does include an image of a fist by her title line) and only one process is active at a time, while in the audiovisual presentation there are several co-occurring modes and processes active for each moment in time. One example of this is where Emma uses an animation, burning the image of a fist, reinforcing the message of anger and heated feelings that underlie the whole issues of segregation and discrimination. The difference in constraints and affordances between essay and audiovisual presentation is obvious when we start looking closely as the interpersonal metafunction. Not that it is missing from the essay. The metafunctions are always active simultaneously, but the interpersonal metafunction is more active or possibly stronger in the audiovisual presentation, where the visuals modes with ease afford means for connecting to the reader at both emotional and interpersonal levels. Images and co-occurring verbal modes allow for subjective positioning to occur at different levels simultaneously.

The major difference between the two media of representation in Fanny’s two representations of knowledge is that in the audiovisual presentation there is a voice clip added instead of Fanny reading the quote. This adds a layer of authenticity, and the image adds information that is not present in the essay. It gives us a visual idea of what aboriginal people can look like. The image and the co-occurring verbal and visual modes afford subjective positioning taking place at different levels simultaneously, but with partly disparate messages. where the message in the verbal modes implicitly tells us that the aboriginal population are just people like anyone else who were badly treated, but where the image tells us something else, that they are different maybe even exotic.

In Greta’s written and audiovisual texts the use of visual and verbal co-occurring modes allow for symbolical processes to be active simultaneously with classifying and/or analytical processes in the audiovisual text, while in the written text, linear sequentiality and the limited number of modes active, mainly writing and layout, allow for less simultaneous activity and meaning making. A striking difference between the two media of representation, when Greta is making meaning and representing her knowledge in written and audiovisual text, is that the images in co-occurring modes allow for subjective positioning to occur at different levels simultaneously and where the visual modes contribute with emotional load in a way that the written mode lacks.

The central message in the students’ essay and audiovisual presentations stayed largely the same. They mostly stayed on topic, where they transferred and transformed content across the different media,
shaping and re-shaping knowledge, and creating a whole, a union, of written and audiovisual texts, where the sum of the two is more than the parts. The students transferred and transformed knowledge across written, spoken and visual modes. They applied this to narration, temporality and sequentiality, to engagement and arrangements, in shaping and representing their understanding of the areas of civil rights (from The USA and Australia) that they had chosen to focus on. Both the written and the audiovisual media carry their unique affordances for shaping knowledge and making meaning. Each student told a unique story with a unique focus and shape. This is true even for the students who had chosen topics that were very close to each other’s, and where they had in part chosen to use the same images. The school essay is a familiar form of writing for secondary students who work with written text in many subjects, and the written mode is still dominant in school (Jewitt, 2011; Jewitt & Kress, 2010; Kress et al., 2005). Audiovisual presentation programs and media are less fixed, although they come with ready-made design elements. There is however no century long traditions for making audiovisual presentations comparable to that of the traditions of written text. The form, or shape, of the audiovisual presentation is in this respect less fixed, and less stable than the form of the essay. Essays encourage specific forms of reading, of engagement (Kress, 2010, p. 143). The sequential layout of a written text determines the order of how the reader engages with the text, title, paragraph, sentence et cetera in set order. It is fixed and not fluid, but the audiovisual presentations, which are not fixed and stable in the way of written essays, have at one level a sequentiality that is as fixed as that of the written essays. The recorded format is sequential in time and in the order of the slides, and the spoken commentary is as sequential as the written essay, but the multimodal format also allows for less sequential reading of the slides, which encourages parallel reading, and the presentation as such is a continuous form of parallel reading where layout, image and writing co-occur with the spoken narrative. The layout of the slide combining image, writing, colour (typeface) facilitates a parallel visual reading, a visual movement of going back and forth. This is a fluid reading in mutual interaction of several modes, writing, speech, image, layout, which is simultaneously both sequential and parallel but at different levels. The narrower modal shape of the essay also narrows down the space for the reader’s interpretations. The audiovisual medium affords the simultaneous use of multiple modes. All six students have produced multimodal representations of knowledge, but the number of modes co-occurring and multimodal complexity vary. In all student essays and audiovisual presentations the organisation of content is dependent on compositional elements. For the written mode these are limited to words and phrases, while for the audiovisual presentations compositional elements include words and phrases (just as for the essays), but also text animations, images and built in design features in the presentation program Keynotes, such as colour, style and templates for layout. As for ontological considerations, writing dominates completely over other modes for representing knowledge and conveying meaning in essays, while in the audiovisual presentations verbal and visual modes have equal standing in representing knowledge (Kress, 2010; Kress & van Leeuwen, 1996/2006).

At large, the students were more careful in shaping written essays, where meaning is mediated through the fixed logic of the written text, paragraphs as a logical unit, linking between paragraphs, and there was more evidence of abstract reasoning in the essays compared to the audiovisual presentations. The audiovisual presentations also afforded more flexibility in how to shape knowledge, and in how to organise and arrange the content. In the audiovisual presentations the students used more concrete examples but in verbal and visual modes. That is they used images to illustrate their topics and to convey emotive content, but they also exemplified more in speech, giving more examples and more detail. In this way the communicative affordances of the written and audiovisual texts were apparent. A multimodal format also afforded the students the possibility to combine multiple ideas in a way that
was not possible in the essays constrained by the fixed character of the written mode, which added elements of creativity in the audiovisual (multimodal) medium not present in the essays. Another, possibly obvious, reflection is that writing was the dominant mode in the essays. Although present in the audiovisual presentations it did not dominate, instead it was a combination of image and speech that shared the function of making meaning, affording a rich semiotic space for student in which to shape knowledge. What becomes apparent when looking closely at the students’ essays and audiovisual presentations, and comparing these, is that the audiovisual medium makes it easier for the students to directly create a relation the reader of the audiovisual texts. The written medium, the essay, and the clear, instructions for how to construct a written text are both a help and a hindrance for the students. Their written texts follow the instruction more closely than their audiovisual texts. These on the other hand show more variation in structure and logic, but also in tone and style. The norms or models for constructing written text, with which the students are fairly well versed, give them something to lean back on. They know what to do when writing an essay. The lack of such norms (in school contexts) for producing audiovisual text, open up both for elements of confusion, but also freer forms of expression. There are norms for visual and audiovisual communication. What I am saying here is that students are not trained in these in school in the same manner as they are in writing essays. The students then fall back on models for audiovisual text from elsewhere.

4.4 Analysis 3

The third analysis is targeted at revealing transduction processes across the students’ written and audiovisual texts, and uses the metafunctions of language as a starting point for analysing transduction, and a basis for discussing the third research question how can the students’ text production be understood in terms of transduction.

4.4.1 The ideational analysis

Transduction of ideational meaning is reflected in what content is transferred or transformed between essay and audiovisual presentation. Proportions of transduction processes reveal to what extent the student is transferring, and transforming, ideas and content in the process of transduction. Intensity of ideas in the transduction process across the written and audiovisual texts, reveals where, on which conceptual themes, the students place most focus. This reveals what meaning becomes central in the students’ knowledge representations.

In Ada’s essay and audiovisual presentation the main, and most obvious, differences lie in the content (idea units) not part of any transduction process. There is a whole part of the essay that has no corresponding content in the audiovisual presentation in any modes used, and this is the comparison to Sweden and Swedish issues. When looking at proportions of transduction processes from Ada’s essay to audiovisual presentation we find that almost half of the idea units in the essay do not correspond to content or ideas in the audiovisual presentation, which means Ada is including content in her essay that is not present in her audiovisual presentation. Less than half of the idea units are transferred between essay and audiovisual presentation, and a smaller part is transformed but related ideas. Reversing the direction of analysis, and looking from audiovisual presentation to essay, the proportions look slightly different. In that direction we find more than half of the idea units in the audiovisual presentation transferred in the essay. For the rest of the audiovisual text there is about as much text that is transformed across audiovisual text to written text, as parts of the audiovisual text that do not correspond to idea units in the essay. Another difference lies in the choice of what details
and examples to include. In the audiovisual presentation the circumstances of Martin Luther King Jr.’s murder are given, in the essay the Montgomery bus boycott is named, but not vice versa, which are examples of giving new shape to knowledge. There are other differences in how Ada expresses her own thoughts. This is clearly stated in the essay, but only implicit in the audiovisual presentation. Other differences include the list of sources in the essay, and the lack of such in the audiovisual presentation. Almost all idea units are subject to a change of mode across the essay (using the written mode), and the audiovisual presentation where visual modes and speech have equal weight, and where the written mode is present but in a subordinate function. Analysis of the intensity of ideas in the transduction process identified the central themes 'civil rights', ‘race, colour’, ‘discrimination, segregation’, ‘legislation’, ‘political activism’ and 'Ada’s reactions’. In the essay Ada is fairly evenly distributed conceptually, but with slightly more intensity for 'civil rights’, and then closely followed in intensity by 'race, colour’, ‘discrimination, segregation’ and Ada’s own thoughts. ‘Legislation’ and ‘political activism’ together make up only a small part of the text, and the intensity is also considerably lower for these themes. In the audiovisual presentation most intensity is placed on discrimination and colour/race. Together these two conceptual themes make up the large part of the ideas communicated. Ada has chosen to exclude content in the audiovisual presentation that is present in the essay, but there is also a more intense focus on the issues of colour and discrimination in the audiovisual presentation compared to the essay, where the use images reinforces the weight and intensity of these issues.

In Camilla’s case it is less the choice of what to include that differs between the essay and the audiovisual presentation, but more what shape knowledge is given in each representation. This is a difference that applies to how Camilla uses words and phrases as she moves between the modes of writing and speech, but also in how the shape of knowledge is changed, as almost all idea units are subject to a change of mode across the essay (using the written mode), and the audiovisual presentation where visual modes and speech have equal weight, and where the written mode is present, but in a limited and subordinate function. The analysis of proportions of transduction processes in Camilla’s essay across to the audiovisual presentation shows that half of the ideas (idea units) are transferred between essay and audiovisual presentation, fewer ideas are not transferred or transformed (and only found in the essay), and even less content is transformed. Turning the analysis in the other direction the proportions change, so that a large majority of the ideas are transferred across audiovisual presentation compared to the essay, only a very few idea units are not transferred or transformed, and the rest is transformed between audiovisual presentation and essay. Looking at intensity of ideas in the transduction process across the written and audiovisual texts, five themes were identified as being most salient or central. These were 'civil rights’, ‘civil rights movement’, ‘race/colour’, ‘discrimination/segregation’, ‘legislation’, and 'Camilla’s reactions’. In the essay Camilla is fairly evenly distributed conceptually between the themes, with a slight emphasis for her own reactions or thoughts and least focus on 'discrimination/segregation’. The distribution of intensity between themes does not differ much between essay and audiovisual presentation, although in the latter there is some more focus on the civil rights movement compared to the other themes. Otherwise the proportions of intensity is more or less evenly distributed in the audiovisual text.

For Daniel the differences in ideas not represented across the essay and audiovisual presentations are a matter of different details included, and differences in linking devices, and use of sources. This is less an expression of including or excluding different content altogether but rather an expression of the affordances of the different media, and the reshaping of knowledge, giving knowledge varied form as Daniel is making meaning, which becomes visible with close study of the transcription matrices. There
are detailed differences in information included for slavery for example, and in how Daniel expresses his own thought, but he stays within his conceptual themes. There are also levels of complexity present in the audiovisual presentation, which become apparent when the transduction process is studied closer. Daniel is working (relatively) less with transferring ideas, and more with transforming ideas between essay and audiovisual presentation. Almost all idea units are subject to change of mode across Daniel’s essay and audiovisual presentation, which is a process of transduction. The essay uses the mode of writing. In the audiovisual presentation there is speech but also image, layout, colour etc. Although there are some examples of writing that correspond word by word between essay and audiovisual presentation this is a minor occurrence. When looking at proportions of ideas transduced from essay to audiovisual presentation we find that half of the ideas in the essay correspond (a process of transferral) to the audiovisual presentation. In the other half of the text the proportions are even between the ideas that are transformed, and those that are not transduced at all. The other way, in the direction for audiovisual presentation to essay, the proportions are different. Significantly more than half of the ideas in the audiovisual presentation are found to correspond to ideas in the essay, while the proportions in the rest of the text for ideas transformed or not represented equal those for the essay. Ideas not represented are ideas that are uniquely represented in the audiovisual presentation and not present in the essay. When it comes to the intensity of ideas in the transduction process there were seven conceptual themes identified in Daniel’s essay and audiovisual presentations. These were ‘civil rights and equality’, ‘race/colour’, ‘slavery’, ‘abuse and mistreatment’, ‘war and conflict’, and ‘Daniel’s reactions. For the essay there is most emphasis placed on Daniel’s own reactions, while in the audiovisual presentation there is less difference between the themes but ‘civil rights and equality have a few more idea units compared to ‘slavery’, ‘war and conflict’ and ‘Daniel’s reactions’, which all are quite distributed as to intensity. What is clearly discernible is that the intensity is considerably lower here for ‘race and colour’ and ‘abuse and mistreatment’.

For Emma the main themes of ideas that are transduced across essay and audiovisual presentation are centred on race and segregation. These themes are also present in the ideas not transferred, translated or transformed from essay to audiovisual presentation. To some extent this can be seen less as an expression of including or excluding different content altogether, but rather an expression of reshaping of knowledge, giving knowledge varied form as Emma is making meaning. This becomes visible with close study of the transcription matrices, something that was even more apparent in Daniel’s work. There are differences in information included, and in how Emma expresses her own thoughts but the main focus and intensity is placed on the same conceptual themes, although more areas of content and ideas are present in the essay. There are also levels of complexity present in the audiovisual presentation, which become apparent when the transduction process is studied closer. If we disregard the ideas that are not transduced and concentrate on the areas of content where transduction processes are apparent, we find that Emma is largely working with transforming ideas between the two types of text rather than just transferring ideas, although there are ideas that are more or less directly transferred. Emma is transforming ideas in several ways. Knowledge is reshaped both at micro and macrolevels. Ideas are reshaped, repeated and remodelled, processes that can be discerned at the level of idea unit. The whole texts are given different shapes, not just due to the differences afforded in the separate written and audiovisual media, but also in the order ideas are presented, and in what details and examples are used. Almost all idea units are subject to change of mode across Emma’s essay and audiovisual presentation, which in itself is a process of transduction. There are in Emma’s essay and audiovisual presentation ideas not represented across the two media. There are both details not included, and whole areas of content present in the essay, but not in the audiovisual presentation. This includes all content dealing with comparisons to Sweden, and to a large extent also Emma’s own
reflections, which are present to some degree in the audiovisual presentation but implicitly, while in Emma’s essay she explicitly declares her reflections and opinions. A list of sources are included in Emma’s essay but completely absent from the audiovisual text. Some ideas in both essay and audiovisual presentation are not relatable to the major themes identified. Disregarding the list of sources and other instances of paratext or linking, there are more of these embellishments, or ‘off topic’ information, in the essay compared to the audiovisual presentation. For proportions of ideas transduced, we find that most of the ideas in Emma’s essay are not represented in her audiovisual presentation. The ideas in Emma’s essay that are transferred are about equivalent to the amount of ideas that are transformed. What is striking here is that most of the ideas in Emma’s essay are neither transferred nor transformed, hence not transduced at all across to Emma’s audiovisual presentation. Looking in the other direction, from Emma’s audiovisual presentation to the Essay, the picture is very different. Here we see that most of the ideas in the audiovisual presentation are represented in Emma’s essay as well. The proportions of ideas transferred and transformed are roughly equivalent while only a few ideas are not transduced at all, with no corresponding content present in the Essay. For the intensity of ideas in the transduction process across the written and audiovisual texts, there were six conceptual themes identified in Emma’s essay and audiovisual presentations. These were ‘civil rights’ (and/or the civil right movement), ’discrimination/segregation’, ’race and/or colour,’ ’slavery’, ’legislation’ and ’Emma’s own reactions’. In Emma’s essay the intensity of focus is placed on ideas related to race, colour or issues of discrimination/segregation. If we include Emma’s reactions to these areas, these ideas make up most of Emma’s text. Emma is giving as much space to her own reactions, as she is to issues of discrimination. The areas of slavery, legislation and the title area, civil rights, are together (only) given slightly more space than issues of race. In Emma’s audiovisual presentation there is less intensity for Emma’s own reactions, which are in parity with the area of legislation. The intensity is evenly distributed between the themes ’civil rights’ (and/or the civil right movement), ’discrimination /segregation’, ’race and/or colour’, which together make out the large majority the ideas in Emma’s audiovisual presentation, while the theme 'slavery’ is negligible, and barely mentioned in the audiovisual presentation. Hence, in Emma’s essay there is comparatively more intensity for Emma’s own reactions. Although visual modes generally afford more means of expressing emotions and point of view compared to the written mode, there is more emphasis to emotion in Emma’s written text than in her audiovisual text. The common themes identified include slavery, which is present but of no real consequence in the audiovisual presentation. Except for the area of 'slavery’, and more focus on Emma’s own reactions in the written text, the intensity of themes of concepts are comparable in Emma’s written and audiovisual texts. Emma is including certain ideas and excluding others as she is giving shape to knowledge in writing and in audiovisual modes.

There is in Fanny’s representations of knowledge a considerable amount of ideas that are exclusive to the essay, to the point where most ideas in the essay are not represented at all in the audiovisual presentation. Hence, for ideas not represented across essay or audiovisual presentation there are whole areas of content present in the essay but not in the audiovisual presentation. This includes all content dealing with comparisons to Sweden, Fanny’s own reflections and sources, as well as details and examples of ’abuse and discrimination’, and elaboration about ’white society’. Fanny is translating part of her essay, transferring information and ideas rather than actively transforming ideas. However, processes of transduction are active in the change of medium. The main theme of ideas that are transduced across essay and audiovisual presentation are centred on abuse and discrimination, and this theme is also present in the ideas not transferred, translated, or transformed from essay to audiovisual presentation. If we disregard the ideas that are not transduced, and concentrate on the areas of content where transduction processes are apparent, we find that Emma is translating and transferring ideas
between the two types of text. In the essay writing is dominant, and in the audiovisual presentation speech is dominant although there is one image and one case of writing used. For proportion and intensity of ideas transduced we see only a small part of the ideas represented in Fanny’s essay as transduced across to the audiovisual presentation, and the ideas that are transduced are transferred word by word, but represented using speech in the audiovisual presentation, while written in the essay. If we then look in the other direction we find that all of the ideas represented in speech in the audiovisual text are directly represented in the written mode in the essay. The new content, or ideas, that is present in the audiovisual text are the ideas that are carried by the image in the visual mode, and the written text “multicultural society”, which is the one case of transformation found across the two text types. The image carries meaning that is disparately related to the rest of the ideas in the audiovisual presentation. The one image used shows a scene from a traditional aboriginal activity, and can be related to the idea of aboriginal people and culture, but at a general level not quite related to the central problem or topic, which is stolen aboriginal children. The proportions of ideas that are transferred or transformed show a complete dominance of direct transferral. The impression is that Fanny is reading from the first part of her essay when she is making (recording) her presentation. Apart from the writing “multicultural society” which is placed as a heading in the image that she is using as a backdrop for her speech, and a concept that is introduced in Fanny’s reflections at the end of her essay, there is no other case of transformation process. There were four themes of central ideas identified in Fanny’s written and audiovisual text, ‘indigenous people/race’, ‘white society’, ‘abuse and discrimination’ and ‘Fanny’s reactions’. (Please note that the focus of analysis is transduction and the large part of content included in the essay but not in the audiovisual presentation was down-played when identifying themes). In Fanny’s essay most intensity is placed on abuse and discrimination and secondly on her own reactions and reflections, with less but about equal focus on ‘white society’, and ‘indigenous people’. In Fanny’s presentation even more intensity is given to ideas related to abuse and discrimination, while her own reflections are completely absent. Equal amount of focus is given to ideas relating to white society and indigenous people. Except for the area of ‘Fanny’s reactions’ the intensity of themes are comparable in Fanny’s written and audiovisual texts.

In Greta’s two texts there are areas of content that are exclusive to the essay or the audiovisual presentation. Civil rights is only mentioned in the essay, as is the information that there were attempts to include indigenous people into society, and that indigenous children could be fostered and raised to be ‘white’. Another area of information only found in the essay is that the children were lied to and not allowed to know anything about their families, that they had their names taken from them, and were given new identities, and should forget their past. In the essay Greta specifically points out that the stolen children have their identities taken from them, making them ‘new’ people. In the audiovisual presentation this is exemplified with how aboriginal children were given new names “like James or something”. The audiovisual presentation takes up education, and that the stolen children did not get any higher education as they were going to be servants. There is also a quote by a ‘stolen child’, expressing how they were half white and the result of rape and not wanted. In the audiovisual presentation rape is not included, instead the ‘same’ area of content is described with, ‘aboriginal girls got pregnant with white men, and that the children would be whiter and whiter until everyone was white’. Essay and audiovisual presentation also end differently. The essay ends with “they will only get negative experiences of this way of thinking” and the audiovisual presentation with “there’s no right or wrong kinds of people” but not everyone want to accept this”. What is included in both media of representation are the main ideas or themes of societal abuse of indigenous people, to some extent the effects of this, and Greta’s reactions and opinions, while certain ideas or concepts are spelled out in one representation of knowledge but implicit, or absent, from the other. The audiovisual presentation
includes both images and speech but also writing. Most idea units are subject to change of mode across written and audiovisual text. Writing in transduced into speech, but also into image, and/or the other way around. Transduction of interpersonal meaning across essay and audiovisual presentation is seen in how subjective positioning and style differ between the two media. About half of the idea units are translated across mode and media between essay and audiovisual presentation, where we can see that speech in the audiovisual presentation corresponds more or less directly to writing in the essay. The rest of the idea units are divided between ideas that are only present in either, but not both, essay and audiovisual presentation, or are transduced and changed in character. A majority of the ideas in Greta’s essay correspond to ideas in her audiovisual presentation. When we go the other way and look from audiovisual presentation to essay we find that almost the entire presentation corresponds to ideas in the essay. When looking at proportions and what is not represented, that is unique content in essay and audiovisual presentation, there is less than half, but a substantial part of the ideas in the essay, not represented in the audiovisual presentation, but only a small part of the ideas in the audiovisual presentation that do not correspond (are translated or transduced) across essay and audiovisual presentation. For the intensity of ideas across essay and audiovisual presentation, common central themes identified in Greta’s written and audiovisual texts, were ‘indigenous people’, ‘white society policies and effectuation’, ‘abuse and mistreatment’, ‘effects’ and ‘Greta’s reactions’. In the essay most intensity is placed on ‘abuse and mistreatment’, while in the audiovisual presentation the theme given most weight is ‘white society policies and effectuation’. In second place for intensity in both essay and audiovisual presentation we find ‘Greta’s reactions’, which is a subjective position. In the essay the themes ‘indigenous people’ and ‘white society policies and effectuation’ are given almost as much weight, and last (as to intensity) comes the theme ‘effects’. This is turned around in the audiovisual presentation where the themes ‘abuse and mistreatment’ and ‘effects’ are given equal weight, while indigenous people is the theme with least intensity in the transduction. Greta has chosen to include certain ideas, to represent certain knowledge and excluding other ideas, other information when making meaning and giving shape to (her) knowledge).

4.4.2 The interpersonal analysis

Transduction of interpersonal meaning across essay and audiovisual presentation is found through analysing transduction of elements indicating style and subjective positioning. At one level Ada is more subjective in her written text compared to the audiovisual presentation. In the essay she is openly stating opinions and reflecting on her chosen subject. At another level the audiovisual presentation affords more subjectivity through the use of images, which we relate to at a more emotional level than ‘mere’ word. Another factor creating subjectivity in the audiovisual presentation is that Ada uses several examples to prove her point, or get her message across, the level at which segregation occurred, the separate waiting rooms, reinforced by the use of images, the eyewitness referred to in the audiovisual presentation, which is missing from the essay. In conclusion the audiovisual presentation stays at a more subjective level all through the audiovisual text while the written text, the essay, is more informative in style at the beginning and the purely subjective in the concluding parts.

In her essay Camilla is using an informational and objective tone of voice in the introduction and body of her text. The concluding paragraphs, where Camilla argues for her own point of view and expresses her thoughts on the matter, address the reader in a more direct way and is openly subjective with turns of phrase such as “I think”, “according to me” et cetera. The audiovisual presentation also begins with ‘giving information’ and ends with Camilla’s own thoughts, opinions and arguments but is all through the (audiovisual) text of a more relational style. Camilla uses questions, which she then answers, the images also contribute to a feeling of more direct address and to draws the ‘reader’ in closer to the text
and the meaning Camilla is making here. In conclusion the audiovisual text stays at a more subjective level in its entirety while the written text, the essay, is more informative in style at the beginning and the purely subjective in the concluding parts.

Daniel starts his presentation with a direct address, "Hello everyone" creating a relation to the listener(s) by using a greeting the way we do when we meet people face to face. The essay on the other hand starts in a more distanced general objective and informative style. Here we find an example of transformation in interpersonal meaning in the transduction across written and audiovisual text. More than half of the idea units in essay and audiovisual presentation are translated across modes and we can see that speech in the audiovisual presentation corresponds directly, or very closely, in content with writing in the essay. The rest of the idea units are divided between ideas that are only present in either essay or audiovisual presentation, but not both, or have been transformed and changed in character. Both Daniel’s essay and audiovisual presentation are relational in style but we can see that content that is presented in a more distanced and informational way in the essay, while presented in a more subjective way in the audiovisual presentation, where the use of images in the audiovisual presentation contribute to the differences in character between the written and audiovisual text. Half or more of the content in Daniel’s written and audiovisual text is transformed rather than translated.

Emma starts her audiovisual presentation with a direct and informal mode of address; "Hello. I am gonna talk about civil rights". The direct address ‘hello’ is a greeting, such as when we meet people face to face, and the use of informal spoken language such as ‘gonna’ creates an opening with an informal relation to the listener, while the essay starts in a distanced general objective and informative style with "The American Civil War brought the slave era to an end in the Confederate States of America". This is an example of transformed interpersonal meaning in the transduction across written and audiovisual text. For the ideas that are transduced across essay and audiovisual presentation about half are transferred and half transformed but here are very few (close to none) cases of translation between written and audiovisual text. Hence, for Emma there are processes of reshaping knowledge at several levels between essay and audiovisual presentation giving knowledge new shape and character. Both Emma’s essay and audiovisual presentation are relational in style but we can see that content in the first part of Emma’s essay is presented in a more distanced and informational way compared to both the second half of the written text and to the audiovisual text.

Both Fanny’s representations of knowledge use an informative style. The use of a voice clip from a speech by (former) Australian Prime Minister Kevin Rudd adds a level of engagement with the reader/listener in the audiovisual presentation that the essay is lacking although the words and phrasing are exactly the same. The quote in the essay feels more formal than listening to the voice of Mr Rudd. The inflections and pacing of the speech are missing from the written representation. Both Fanny’s representations of knowledge are informative in style but we can see that content in the first part of Fanny’s essay is presented in a more distanced and informational way compared to the audiovisual presentation where the use of added multiple modes such as image and speech affords added levels of emotional and subjective character.

In Greta’s representations of knowledge we see content presented in a more neutral informational way in the essay, compared to the audiovisual presentation that uses a more subjective and relational style. The use of image pitch and intonation et cetera in the audiovisual presentation contribute to these differences in quality, or character, between the written and audiovisual text. The major part of the content in Greta’s written and audiovisual text is translated rather than transformed. Only a few idea units are transformed.
4.4.3 The textual analysis

Composition and framing are areas where we can study transduction of textual meaning. These are of different character in any written and audiovisual text and images, and layout supplies elements of contextuality and coherence, which simply are not available in texts using the written mode. Transduction of textual meaning across the students’ written and audiovisual texts can be found where idea units are transferred and transformed.

Ada’s written and the audiovisual texts differ in the use of linking and how sources are listed, but the audiovisual presentation mostly follows the content order of the first part of the essay. The structure and sequencing is largely transferred across essay and audiovisual presentation, where the essay is organised using sentences and paragraphs while the audiovisual presentation is sectioned by the use of slides and images, and speech is segmented with pauses and breaths.

The structure and overall organisation of Camilla’s essay and audiovisual presentation follow the same pattern, starting with information and background, followed by a comparison to Sweden and lastly Camilla’s own thoughts on the issue. Differences are found in composition and framing, and in how Camilla links and creates cohesion in the two types of text. The written text is organised using sentences and paragraphs and the audiovisual text is sectioned by the use of slides and images, and speech is segmented with pauses and breaths instead of full stops as the formal end of a sentence. In the audiovisual text the images help supply cohesion, something the written mode does not afford. Camilla also links between slides, but in a ‘looser’ more conversational way with asking a question and immediately answering it, “why… because you can say” than in how she links between paragraphs in her essay.

As to transduction of textual meaning by Daniel, we find that when idea units are transferred and transformed. Daniel changes the arrangements and order but in sections keeps the sequencing within a section of related ideas. If we look at chunk of content the order between these can be moved but the internal order stays largely the same. Composition and framing are of different character in the written and audiovisual text, where images and layout contribute dimensions of contextuality and coherence not available in the written mode.

Emma keeps the same overall structure in both representations of knowledge, starting with background moving on to segregation and the civil right movement (the comparison to Sweden is only present in Emma’s essay and placed after the other areas of content). However, Emma changes the arrangements and order of ideas while keeping the sequencing within one section of related ideas. Composition and framing are of different character in the written and audiovisual text, where the use images and layout contributes dimensions of contextuality and coherence, which are not available in the written mode. Emma does however seem more confident with the format of the written essay where she is dealing with the content and all areas required in the instruction in a concise and structured way and where she also includes her sources. When studying Emma’s work it becomes plausible to assume that Emma has written her essay first and then made the audiovisual presentation as a complement to her written text. If looked at this way the audiovisual presentation does complement the essay affording more ways or other areas for Emma to express her ideas and knowledge of Black Civil Rights, issues of colour and segregation.

In Fanny’s case it highly likely that the essay is written first as she appears to be reading the text in the audiovisual presentation rather than ’speaking’ it. In this way she stays letter perfect in the verbal mode of speech compared to the (verbal) written mode in the essay, but it is only a very brief part of the essay transferred and transduced to the audiovisual presentation, the title, the lead, and the first one
and a half paragraphs. All textual devices such as structure, linking et cetera are therefore exactly the same. However framing in the written and audiovisual text are different in character as the use of image, sound and layout contributes dimensions of contextuality and coherence that are not available in the written mode, and thus absent from the essay.

When analysing textual meaning across Greta’s essay and audiovisual presentation we find that when idea units are translated the arrangements and order is changed to some extent, but mostly in the way that content is interjected between sequences of idea units that are nevertheless kept together. To clarify, both essay and written and audiovisual text start with background to begin with the ideational (content) corresponds but then there is ‘new’ content, elaborations, added in the written and audiovisual text, which is not present in the essay, a chunk of information is added (interjected) but then the sequence continues in the same order in both representations. There are differences in the affordance of available modes in the written text and the audiovisual text. For example the slides and images used (the images in the second slide being active for most of the presentation) creates cohesion in a manner not possible in text where writing is the dominant mode (as in the essay) and gaze and position become salient but are missing completely from the essay.

4.4.4 Differences and similarities in transduction

There are both differences and similarities between the students in their transduction processes. First we focus on the transduction of ideational meaning. Ada does not transduce the comparison to Sweden and Swedish issues as this area of content is only included in the essay and not present in the audiovisual presentation. In all about half of the ideas in Ada’s essay are not transduced of the content that is transduced. Most content is (just) transferred and only a minor part of the ideas are transformed, while from audiovisual presentation across to the essay a larger proportion of ideas are transduced. In Emma’s and Greta’s knowledge representations there are ideas that are exclusive, either to the essay or the audiovisual presentation. In Emma’s case, to the point where there are more ideas in the essay that are not represented at all in the audiovisual presentation compared to ideas that are. For Greta most ideas are transduced across essay and audiovisual presentation seen from both directions. What is striking regarding transduction across Emma’s representations of knowledge is that most of the ideas in Emma’s essay are neither transferred nor transformed, hence not transduced at all across to Emma’s audiovisual presentation. For transduction seen from the other direction the picture is different, as the majority of ideas in the audiovisual presentation are represented in the essay. This means Emma is excluding a large part of the content and meaning made in her essay from the audiovisual presentation.

In Fanny’s case this pattern is even more pronounced and most of the ideas found in Fanny’s essay are not present in her audiovisual presentation, such the complete area of comparing to Sweden, as well as Fanny’s own reflections. In the other direction the picture is the opposite, practically all of the ideas in Fanny’s audiovisual presentation are transduced across to her essay. For Camilla and Daniel the differences between essay and audiovisual presentation are found less in the thematic content but rather in quality and form. Camilla and Daniel are keeping the content of the ideas closely linked across essay and audiovisual presentation, while Ada excluded a whole assignment component (comparison) from her audiovisual presentation. As Fanny is including little information from the essay in the audiovisual presentation it becomes hard to analyse Fanny’s work with the same level of detail as for the other students. Either Fanny is more confident with the format of the written essay or she has taken a ‘shortcut’ for reasons unknown when making her audiovisual presentation. In either case it is plausible to assume that Fanny wrote her essay first and then made her audiovisual presentation, however this is an assumption. In the essay Ada and Camilla are fairly evenly distributed conceptually between several central themes. In Emma’s essay and Ada’s audiovisual presentation
most intensity is placed on the themes discrimination and colour/race. Ada’s use of images enhances the intensity of these issues. For Camilla and Emma the intensity of themes is largely equivalent in essay and audiovisual presentation. In Daniel’s essay and audiovisual presentation there are several themes present, but in the essay Daniel’s own reaction is given most intensity, while the audiovisual presentation is quite even distributed in intensity between themes. The essay has comparatively more intensity given to Daniel’s own thoughts and reflections, compared to the audiovisual presentation, but the visual modes afford more means of expressing emotions and point of view than does the (single) use of the written mode. Except for this area, the intensity of themes of concepts are comparable in Daniel’s essay and audiovisual presentation. In Fanny’s work there is a large discrepancy in content and ideas represented in essay and audiovisual presentation the ideas transduced are more or less directly transferred and the intensity of themes are comparable in Fanny’s written and audiovisual texts. In Greta’s essay most intensity is placed on ‘abuse and mistreatment’ while in the audiovisual presentation the theme given most weight is ‘white society, policies and effectuation’. This creates a difference in understanding and meaning. The theme ‘abuse and mistreatment’ is more relational in that it targets feelings of empathy in the reader, while ‘white society, policies and effectuation’ is not unlike the first theme but more distanced and thus in effect ‘more objective’.

Secondly we look at differences and similarities between the students focusing on transduction processes of interpersonal meaning. A pattern emerges when comparing the students’ representations of knowledge, in that the students’ written texts are more objective, or neutral in tone, compared to their audiovisual texts, which come across as more relational, more engaging and more subjective. Ada, Camilla and Greta use an informative and objective style and tone in the first parts of their essays, while being more subjective towards the end, and their audiovisual texts are comparatively more subjective in their entirety. Daniel and Emma are more relational in style in both the text types but we the same qualitative difference in their written texts compared to the audiovisual texts. The written texts are more distanced than the audiovisual texts where equivalent ideas are transformed in the transduction and presented with comparatively more subjectivity. Both Fanny’s texts are informative in style. Fanny stands out as the student where there is little transformation taking place in the transduction process, but also because she is the only student to include a voice clip in the audiovisual presentation, which adds a level of engagement with the audiovisual text that the written text is lacking, even though the essay includes the same information as a quotation, word by word. The written mode adds a level of formality to the quotation that listening to a voice speaking the same words is lacking, even if what is delivered is a formal speech in a formal situation. Here knowledge is given a different shape by added modes that the written text cannot afford, and levels of interpersonal meaning are transduced with added levels of meaning in the audiovisual text compared to the written text, giving those passages of the texts new and different shape as well as changing the character. Daniel and Emma use a direct greeting to the audience, which is a markedly different way to begin compared to the more formal construction of their essay introductions and also different from the more informational style of commencing the other students use in their audiovisual presentations. A greeting engages the audience immediately in a way that is markedly different from stating facts.

Lastly we look at differences and similarities between the students focusing on transduction processes of textual meaning. Ada, Camilla, and Fanny all keep the same overall organisation and structure across essays and audiovisual presentations. Fanny has a limited part from the essay represented in the audiovisual presentation and she stays ‘letter perfect’. Daniel and Emma change arrangements and the order in the process of transduction. At a detailed level both Daniel and Emma change arrangements and the order of ideas, but keep the sequencing intact within a section or chunk or related ideas. What
this means is that when looking closely at a chunk of content, we can see that the shape of ideas can be transformed and the order of ideas can be moved while the internal order of content is kept largely the same. Greta changes order and arrangements to some extent but in a different manner from Daniel and Emma. Greta keeps the general overall structure and interjects content between sequences of idea units that are nevertheless kept together. There are differences in composition and framing both between the two text types and in how the individual students have shaped their representations of knowledge. Differences in how linking is used for creating cohesion in the texts is most apparent in Camilla’s and Daniel’s two types of text. Camilla links between slides, just as she links between paragraphs in her essay, but the linking between slides is ‘looser’ and different in character as she ends one slide with asking a question to answer it in her next slide. For all students framing of the mediums of written and audiovisual text differs in character. The use of images, animations and embedded tools for overlapping from one slide to another in the audiovisual presentations supplies means for linking and creating cohesion that are simply not present in the essays, which have the written mode and the frame of the ‘paper’ to work with.

4.4.5 Meaning and transduction

The third research question, how can the students’ text production be understood in terms of transduction, was targeted at uncovering processes of transduction between and across the students’ written, and audiovisual texts. Transduction according to Kress (2017) involves ontological change, or shift. "Given that materiality, entities, process . . . change, transduction always produces ontological change” (Kress, 2017, p.44). But this should also entail an epistemological change/shift, a shift in knowledge, as the how we understand the world is dependent on knowledge as knowledge and understanding (making meaning) are inseparable. The process of transduction requires students to think about making meaning in new ways (Harste, 2000; Kress, 2017; McCormick, 2011), as they shape their different material representations of knowledge, the essay and audiovisual presentation. This makes transduction a process that requires reflective as well as innovative thinking. It is not just a process of mapping content from one modal system onto another. This becomes apparent to varying degrees for different students, when they as sign-makers choose and shape signs to make meaning (Jewitt, 2014; Kress, 2010, 2017; Kress & van Leeuwen, 1996/2006).

Daniel is one student whose two representations of knowledge show a considerable degree of reshaping knowledge in innovative and ways, including reflections. He is shaping complex signs, texts, using and orchestrating the available modes in the two different media after their affordances, and after what he finds is the most apt way to express his meaning (Jewitt, 2014; Kress, 2010), as he is giving shape to, and transducing what he knows and had learnt, across the different media of written and audiovisual text. Daniel stays within the same conceptual themes across essay and audiovisual presentation but varies the form and content as to details included. For example when introducing his essay Daniel makes a generalising, but specific statement. ”White people and black people are equal, which they are in the majority of the world. For us today it’s obvious that everyone should have the same civil rights” where the idea of a world where equality is the norm, is not directly present in his audiovisual presentation; Conceptually related, but using different details, is the passage in the beginning of Daniel’s audiovisual presentation where he shows an image of slaves working, and comments, “today this is an unimaginable picture. This would never happen in today’s society”. In Daniel’s case there are more ideas that are transformed than ’just’ transferred in the process of transduction, and ideas are distributed, reshaped and remoulded in several ways and at several levels in the material representations of knowledge. This can be illustrated with a quote from Daniel’s essay; "At year 1968 the Black people got the same civil rights as white people in America”, which is
reflected in the slide showing a photo of Martin Luther King speaking to a huge crowd with writing below the image, ‘I have a dream! - Martin Luther King, The civil rights movement 1954-1968, 1968 - End of segregation’, but also in the narration, “in the end the difference in civil rights between black and white came to end of segregation . . . this end of segregation took place in year 1968”. Knowledge represented and given form in one sentence in Daniel’s written text is distributed over a section of quite a few idea units, almost a minute of speech, but is placed within one and the same episode. This section from the visualisation of transmediation across Daniel’s written and audiovisual texts is shown below in figure 10.

In all the students’ written and audiovisual texts their interest becomes visible in how they give shape to knowledge, or their choice of what modes they consider best suited for the task at hand. “Meaning is newly materialized in the different (material) entities and processes of the ‘recipient mode’; and, where that applies, in the different logic of the recipient. In transduction both profound change . . . and continuity are at issue” (Kress, 2017, p. 44). Something is taken away and something is added but a central core remains, around which the student can create new understanding. It may also mean that a student has understood something in a new way through the process of transduction. S/he knows a bit more when given the means to express knowledge in a different way. The results showed a pattern for all students where many of the ideas, or much of the knowledge represented, was present in both the student’s essay and audiovisual presentation. Hence we can see that there is a core content that is transduced, and around which the students have shaped their representations of knowledge. What differed was the relative ’size’ of this central core that could be identified for a student in both the essay and the audiovisual presentation. This becomes apparent in the modified transcriptions (matrices) used for visualisations of transduction. Fanny stands out as a student where the core is limited and core ideas are transferred and not transformed in the process of transduction across verbal modes. In both speech and writing, Fanny uses the same phrasing and order word by word in the
(complete) audiovisual text as in the first one-and-a-half paragraphs in her written text. The one image included diverges from the spoken content of the presentation (figure 11). Camilla, Daniel, Emma and Greta show a more solid or dense core of knowledge transduced. This can be seen in figure 11, where visualisation of transduction processes for Ada (to the left) and Camilla (to the right) are shown and contrasted. Ada has fewer idea units that correspond either as transferred or transformed across the written and audiovisual text, compared to Camilla. The can also be seen if comparing Ada with the visualisations of transductions for Daniel and Emma, which are shown in figure 12.
Figure 11. Comparison of transduction for Ada (left) and Camilla (right). These visualisations show the density of core content represented with connecting lines.

In the visualisations of transduction corresponding idea units are marked with connecting lines and this is where we can see the central core in the visualisations of transduction. The students are using different modes and logics as they materialise meaning in written or audiovisual text (Kress, 2017).
Daniel and Emma also show more complex re-shaping of knowledge and transformation in the process of transduction (figure 12). For both Daniel and Emma idea units are moved around. These two
students do not only change modes between writing and speech as Ada did but change the order, the use of modes and transform as well as transfer meaning in the process of transduction. As can be read from Emma’s visualisation of transduction there are about as many red lines representing transformed meaning across idea units, as there are black lines, representing transferred ideas.

The results also show that most ideas are subject to change(s) of mode between essay (using the written mode) and multimodal audiovisual presentation. In the essays writing is dominant and in the audiovisual presentations speech and image (including layout, colour et cetera) are equally important, but writing less so, although the mode of writing is present but in a subordinate function. The medium of audiovisual text opens up for more engagement and emotions than does the written text. This becomes apparent in how interpersonal meaning is transduced across these two media. Emma for example uses a relational style in both her essay and audiovisual presentation but the use of images in the audiovisual presentation contribute to differences of emotional and subjective character between written and audiovisual text, while Emma has put more effort into putting dimensions of emotions into verbal modes in her essay these dimensions become (implicitly) apparent in her choice of images and their emotive value. In her essay Emma writes, "I think it is terrible how white people have treated colored people in history, and how there actually could be justified laws that allowed discrimination in America". Here Emma is plainly stating what she feels using the written mode. In the audiovisual presentation Emma says that "public facilities and government services such as education and medical services were divided into separate white and coloured domains” a sentence that is also present in the essay, but represented in the (verbal) mode of writing instead of in speech. Simultaneously to her spoken narration, Emma uses visual modes. She shows an image of a black man drinking from a public water fountain placed only inches from a separate fountain for white people, which is obviously fancier than the tap with the sign ‘coloured’. This image says more than any words about the face of everyday segregation.

The multimodal audiovisual text has many more means for structuring and creating cohesion than does the written text. This becomes visible in how the students’ two texts are transduced and transformed across essay and audiovisual presentations. Camilla for example show differences between essay and audiovisual presentation in both composition and framing, and in how cohesion is achieved. The audiovisual presentation is sectioned using slides and images where the essay is divided into paragraphs, and Camilla links between slides in a conversational way by using questions as a link from one slide to the next; ”Why is she a symbol for the movement?” where she then answers, ”because you can say that she was the one who started it”. Images also help supply cohesion in the audiovisual presentation.
Chapter 5 Discussion

5.1 Digital learning environments and change

Writing this thesis has been a long and winding path, which started some ten years ago when I was teaching English in upper secondary school. The school I worked at transitioned to a digital learning environment where each student, and teacher, had access to their ‘own’ laptop. This was, and is, part of a widespread transition to digital learning environments. Something that has not gone unnoted by authorities or research communities (Ananiadou & Claro, 2009; European Schoolnet, 2013; Government Offices of Sweden, 2017; Hallman & Haglund, 2017; Heath, 2016; Hernwall, Bergström, Graviz & Nilsson, 2012; Hillman & Säljö 2016; Jewitt, 2005; Johnson & Kress, 2003; Organisation for Economic Co-operation and Development, 2017; Government of Sweden, 2014; Swedish National Agency for Education, 2013; Tallvid, 2015; The New London Group, 1996). It has already been more than two decades since the New London Group (1996) advocated the need for a broader view of literacy, which encompasses text created using multimodal digital technologies. Text then needs to be redefined as something more than writing on paper. The gradual change from learning environments where writing and text on paper has been dominant (Kress & van Leeuwen, 2006, p.21) to digital learning environments gives rise to questions about the effects this has on knowledge and learning. In my work as a teacher I gradually started to notice changes in the students’ representations of knowledge. These changes I was observing entailed more than the obvious, that students could write using the computer instead of by hand, or that they could search for information on the internet. These were more subtle changes in form and quality that I was noticing. However, I could not quite pinpoint what I was observing, which was when the field of multimodality caught my interest. Multimodality gave me tools for examining, and understanding, how students shape and re-present knowledge (Bezemer & Kress, 2016; Jewitt, 2014b; Kress, 2010, 2017, Kress & van Leeuwen, 2001, 2006; van Leeuwen, 2011; Selander & Kress, 2010), and concepts, such as transduction (Kress, 1998, 2003, 2010, 2017; Poulsen, 2017) with which to understand students’ shaping of audiovisual text, and remaking meaning in different modes (Kress, 2010, 2017; MODE, 2012). The aim of this study has been to describe and understand six students’ written and audiovisual text production, where texts are seen as representations of knowledge in different modes (Bezemer & Kress, 2016; Jewitt, 2014b; Kress, 2010, 2017, Kress & van Leeuwen, 2001, 1996/2006).

The multimodal approach in this study allows for exploring how the students use various semiotic resources when making meaning, and shaping knowledge, using several different modes, including visual modes, and for studying transduction across both written and audiovisual text, as well as between and across modes. Digital tools (computers and software) that are accessible to the students around the clock, are making it both possible and comparatively easy to create audiovisual texts. As they do so the students are working with the process of transduction where they remake meaning across modes (Kress, 2010, 2017; MODE, 2012). There is also the more general phenomenon of a shift from written text to visual media. The visual is becoming evermore present, and important, in contemporary communication (Höglund, 2017; Kress, 2003). The digital presentation program (Keynotes) used by the students, is a highly visual medium, but one that allows for more than image, such as animations, written text and voice, making it a multimodal means of communication and
resource for representing and shaping knowledge. Multimodality makes out the whole methodological approach of this study, and there is significance given to all modes of communication, which is needed when studying meaning making and transduction (Kress, 2010; Kress 2017).

To design a comparative study methodological and analytical tools were needed, which make it possible to study and analyse meaning making and transduction. Finding such tools proved to be a less than straight forward process. The search for previous literature yielded few multimodal comparative studies (Hafer, 2014; Ranker, 2015) with a multimodal social semiotic perspective (Högblind, 2017; Smith, et al. 2016). I have in all probability missed several, if for no other reason because these could be in languages inaccessible to me, but this pattern presumably reflects the bulk of the studies conducted in the field. There seem to be few comparative studies of representations of knowledge, where the tasks or assignments students work with allow for diverse, dual or multiple media for creating two or more representations of the same content. In Swedish curricula English (and the modern languages) all have requirements, which state that the students should work with text and speech (Swedish National Agency for Education, 2012, 2017c), where the areas of written and spoken language are not separated, which could open up for teachers constructing tasks that result in dual (or multiple) knowledge representations. My assumption is that the changes in education are slower than the technological advancements and that, to begin with, digital technology is used to make the established ways of working smoother, faster et cetera. For example instead of writing with pen on paper the students produce digital text, but the assignments stay the same (Åkerfeldt, 2014). A next step is to add something that is hard to do without digital technology, such as making a film. Teachers in this way add new elements to their classes, but the original tasks (such as writing essays) stay the same in general construction, and things go on much as they always have in school. This can be discerned in the (still) dominant status of the written modes in school (Insulander, 2017; Jewitt, 2011; Jewitt & Kress, 2010; Kress et al., 2005; Kress & van Leeuwen, 2006). Another assumption of mine is that this is (implicitly) reflected in the multimodal research in educational settings. Something first has to take place and become, if not prevalent, at least common enough for it to be noticed and then studied. However, there are many interesting studies within the field of multimodality in educational settings, and some that use a comparative framework.

The study by Smith et al. (2016) proved interestingly close to what I wanted to achieve and was used as a model, an inspiration, and a starting point. Unfortunately the problem of dealing with transduction in two directions remained. The definition of transduction (Kress, 2010, 2017; Poulsen, 2017) clearly states that information is moved from one medium to another. I needed the concept of transduction as a tool for analysis, but was faced with the problem of the direction of the process of transduction. A solution has been to use the concept transduction in a way that deviates in part from the ‘original’ (Kress, 2010, 2017), not in the understanding or use of the concept as such, but in the uncertainty in the direction of transduction when the students have shaped their essays and audiovisual presentations. It would have been easier to study something less ‘devious’ and with fewer pitfalls along the way. However, it was in these kinds of dual tasks and digital knowledge representations where I was seeing most of the changes that had originally piqued my interest and awoken my curiosity. I simply wanted to find out what was going on. Metaphorically speaking I rolled up my sleeves and set to work adapting the framework of Smith et al. (2016), adjusting after Mayer (1981, 1985) and Kress (2010), to construct transcription matrices (Flewitt, et al., 2014; University College London Institute of Education, 2012), and a method that allowed me to compare and understand what I had set out to do. The methodological approach chosen for this study is guided by the theoretical framework of multimodal social semiotics (Jewitt, 2014c; Kress, 2003, 2010; Kress & van Leeuwen, 1996/2006,
2001; van Leeuwen, 1999, 2005), and allows for a research design that recognises different possibilities for representing and giving shape to knowledge, with the use of variety of semiotic resources and different modes (Kress, 2010; Kress & van Leeuwen 1996/2006), where modes are shaped by context (social, cultural and historical). The six students produced their written and audiovisual texts in a school context but also in a larger media landscape with its characteristic, and changing, forms of shaping knowledge and texts (Kress, 2010, p. 23). While media landscapes may be changing fast, education follows at a slower pace, and the written medium is still firmly anchored in the subject areas English and history (Insulander, 2017; Jewitt, 2011; Jewitt & Kress, 2010; Kress et al., 2005; Kress & van Leeuwen, 2006), in which the students in this study were working. However, knowledge can be represented in many ways including multimodal digital formats, which this study shows, and the results reinforce the question of the written mode’s dominant status over visual forms of media in education. The results of this study also show how audiovisual texts open up wider windows to the students’ knowledge (Kress, 1998; Jewitt, 2014b) compared to the more limited medium of the essay and the mode of writing. As multimodal (digital) forms of expression are advantageous for students with different linguistic backgrounds, or who come from backgrounds without traditions of higher education (Bezem er & Kress, 2016; Jewitt, 2003; Wyatt-Smith & Cummings, 2003; Vincent, 2009; Wyatt-Smith & Kimber, 2008), it would be relevant, for reasons of equivalence, for schools to work more with including modes and media beyond writing.

5.2 Significance, questions and answers

The first research question, how do students make meaning and represent knowledge (about civil rights in the English speaking world) in their written essays and audiovisual presentations, has a descriptive intent and makes it possible to reveal, and understand, how the students shape knowledge and make meaning in their essays and audiovisual presentations. When making meaning and giving shape to knowledge in material representations, in the form of essays and audiovisual presentations, the students are active as sign-makers and shapers of knowledge (Kress, 1998, 2010; Jewitt 2014c). In this process they are both making and interpreting signs as best they see fit for their purposes, and the meaning they want to communicate (Kress, 1998; Jewitt 2014c.) In the activity of interpreting they are re-making signs (Jewitt et al., 2016). The students can here be seen as (social) agents using the materiality of available semiotic resources, combining signs into more complex signs, or texts, in the social and cultural context of a Swedish classroom, but also in a wider context of global digital landscapes (Kress, 1998, 2010; Jewitt 2014c). These are characterised by forms of knowledge production, composing text, and what Kress calls "social and semiotic blurring” (Kress, 2010, p. 23), referring to the dissolution of semiotic boundaries and frames. Students are active sign-makers using combinations of available modes. Modes, as such, are the products of people as social agents shaping something material into meaning (Björkval & Karlsson, 2011; Kress & van Leeuwen, 2001). Modes are never fixed or autonomous (Kress, 2010), and come with specific histories of usage as well as different communicative affordances (Jewitt, 2014; Kress, 2003; van Leeuwen, 2005, 2011). The students are using modes together in modal orchestration, or in combination that interact in different and varying ways. Modal orchestration, how modes are arranged, reflect the communicative interest of the students, and carry certain meanings (Bezemer & Kress, 2016; Kress, 2010). The students’ written and audiovisual texts are seen as complex signs realising the metafunctions of communication (Halliday, 1978; Kress & van Leeuwen, 1996/2006). These complex signs, the written and audiovisual texts, can thus be seen as windows into the minds of the students (Kress, 1998; Jewitt 2014c). The
students’ texts are the material instantiations of ideational, interpersonal and textual metafunctions of communication (Jewitt, 2014c).

The results of this study, and the answers to the first research question, do not indicate what the semiotic resources mean in any fixed sense, but focus on meaning potential, as the study investigates how meaning and knowledge is shaped by the six students in their essays and audiovisual presentation. When the study looks at how semiotic resources allow for a particular case of meaning being made by the students, (the sign-makers), shaping representations of knowledge, I as the reader of these representations am also a sign-maker (Kress, 2010). The act of interpreting the students’ essays and audiovisual presentations is in itself a process of meaning making and this study is yet another representation of knowledge where meaning is made and knowledge is given (new) shape. On this note I would like to emphasise the reflexive character of the study, which should be kept in mind for how results are understood. Returning to the sign as carrying meaning and interest (Kress, 1997, 2010) we can also understand the results in the light of the concept of the motivated sign (Kress, 1993) where the students in their essays and audiovisual presentation have used the semiotic resources most apt for expressing their meaning at a particular moment, and in a particular context (Jewitt et al, 2016; Kress, 2010), which here is English in a Swedish upper secondary school. Behind the motivated sign we find the interest of the student where s/he articulates and realises his or her relation to the event represented (Kress, 1993, p. 174). In this case civil rights in the English speaking world. Interest is complex and framed by the students’ prior knowledge, and past and current experience. In this way the students’ interest is shaped both individually and socially (Jewitt et al., 2016; Kress, 1997, 2010; MODE, 2012). The students’ understanding and subjective position should be seen in relation to the meaning s/he is making about civil rights in the English speaking world, not forgetting that school is the social context where the students’ communication and meaning making is taking place, which affects how the students as sign-makers chose and shape signs. This is a reflection of the situated use modes and modal resources (Jewitt, 2014c; Kress, 2003, 2010; Kress et al., 2001, 2004; Kress & van Leeuwen, 2001; van Leeuwen, 1999, 2003, 2005, 2011). The content and topic of the students’ essays and audiovisual presentations is guided by the assigned tasks they worked with.

The first comparative analysis shows there are differences in content, and that different media supply different means for framing text and knowledge (Kress, 2010). Visual modes and the use of images and animations add affective layers to knowledge represented and meaning made. The students make meaning in different ways, even when (re)-constructing the same phenomenon or (re)-presenting the same or similar content, something also shown by Höglund (2017). For example, there are differences in processes in action, which are a reflection of ideational meaning (Kress, 2010; Kress & van Leeuwen, 1996/2006). The ideational metafunction is the content function of communication reflecting how semiotic systems refer to objects in the outside world and how these interrelate (Halliday, 1978; Kress & van Leeuwen, 1996/2006). For ideational meaning in the visual modes Kress and van Leeuwen (1996/2006) identified three characteristic processes classificational, analytical and symbolic. I would here like to remind the reader that the use of these concepts in this study has been expanded to include conceptual ideas where the modes can be visual and/or verbal, thereby including both speech and writing. Classification is active in all semiotic work or resources when classifying or defining, analytical processes in making sense of interrelationships of (visual) conceptual elements, and symbolic processes in what an image (or a sign) means as something other than what is shown (Kress, 2010; Kress & van Leeuwen 1996/2006; Liu, 2013; van Leeuwen, 2011). Ada is a student who stands out with a complete dominance of classification and only a trace of analysis in both written and audiovisual text, although the image in her audiovisual presentation adds symbolical processes. At the
other end of representation we find Daniel who is a student with an even distribution of classification and analysis, in both written and audiovisual texts, with added symbolical processes in the audiovisual presentation. The other students, Camilla, Emma, Fanny and Greta all engage more in classification than analysis but not so that classification is given any extreme dominance. Meaning making is semiotic work (Kress, 2010, p. 121) and the processes seen in action reflected in the ideational metafunction when students make meaning reflect conceptual rather than narrative representation (Kress & van Leeuwen, 2006). How the students place themselves in the context of the situation and the meaning they are making is a reflection of the interpersonal metafunction (Kress & van Leeuwen, 1996/2006). Camilla uses an objective style in her essay, while in her audiovisual presentation the emotive and engaging use of images is in contrast with a more distanced and objective informative style in the verbal modes, and Emma’s audiovisual presentation uses an image of a black fist and an animation in which the image burns to ashes and 'disappears' in the transition to the next slide. Both the image and the animation add more emotive load to Emma’s audiovisual presentation. The first comparative analysis also shows how the students frame and sequence their work, where framing “constitutes a momentary punctuation of semiosis” (Kress, 2010, p. 121). With framing the students establish boundaries between elements in their essays and audiovisual presentations, and create internal coherence in their texts. This is one area where the textual metafunctions in the students’ texts is active. Textual meaning becomes visible in how the students organise their essays and audiovisual presentations to create cohesion and coherence in relation to situation and context. For example Ada, Camilla, Daniel, Emma, Fanny and Greta all use principles of sequencing that are in part based on temporality, as well as content. Fanny frames her essay after the model of a news article using both a title and a lead. Camilla, Emma, Daniel, structure their essays in the conventional style of school essay with flowing text and sectioned with paragraphs, but no use of subheadings, while Ada uses bullet points to frame her texts. How the students have, and can, frame their written and audiovisual texts is dependent on the materiality of the different modes and semiotic resources (Kress, 2010; MODE, 2012; van Leeuwen, 2004, 2011).

The second analysis answered what are the affordances of written essays compared to audiovisual presentations for representing knowledge about civil rights, and looked at differences between students’ essays and audiovisual presentations. In this context we can state that the essay is more limited, or subject to more modal constraints, than the audiovisual presentation where multiple co-occurring modes are active simultaneously. The medium of the audiovisual presentation program offers other affordances than the written mode of the essay. The format of the audiovisual presentations is highly visual, but the recorded speech is given equal importance while writing functions as a supportive mode in the audiovisual texts. Both medium and modes carry affordances and constrains. There are logic constraints tied to materiality, such as temporality, sequentiality and space, which will affect the shape of a representation of knowledge. For example we can only say one word at a time and images are subject to the logics of space (Kress, 2010). Modal orchestration is available at a complex level in the multimodal audiovisual presentations not possible in the essays using the mode of writing. The semiotic resources available for shaping knowledge are organised into coherent written and audiovisual texts, sequencing ideas using verbal and visual modes and applying design elements afforded in the presentation program. What to present goes hand in hand with how to present it. Narration is based on the structure supplied in the instructions, background, comparison to Sweden and reflections. Students may have skipped parts in one or the other text type, but none of the students change the narrative order. The findings show how the students use a variety of semiotic resources and modes, and that the different text types of essay and audiovisual presentations carry
different affordances, which affect the students’ meaning making and the process of transduction (translating meaning) across these different mediums, the written and audiovisual texts.

*Essays* afford structured and stable communication where content can be logically organised after the set logic of writing (Kress 2010) (in accord with Smith et al., 2016). The school essay is a familiar genre for secondary students, which they have worked with in different ways and different subjects all through their school years. The written text is comparatively stable and fixed, while the audiovisual text is multimodal and less subject to norms (learned in school) and hence more dynamic and flexible. The written essay is a text that allows the reader to take in the information at his or her own pace, re-reading if need be, underline et cetera, and where meaning is communicated by the used of specific linguistic structures, words and sentences, which only offer a narrow space for interpretation (Kress, 2010). The students in this study worked with English as a foreign language, which opens up for misunderstandings of how to use words and phrases, and influence from the students’ native language that can cause ambiguous construction in English. Despite these uncertainties, and possible ambiguities in the written texts, these still did not offer more than a narrow space for interpretation compared to the multimodal audiovisual presentations. An effect of the modal constraints of the written text is that the essays are more organised and linear compared to the audiovisual presentations. In the essays meaning is made through conceptualisation and reasoning. The essays also integrate specific examples to support the meaning the students are making. For example Camilla states segregation as a fact, explains the concept, reasons around the background and provides specific and detailed examples of what segregation could look like. The essay has a familiar, stable, and specific format that allows the students to focus the meaning making on content, context, and a clear and linear logic. The students provide specific examples that are contextually and temporally connected to the content, creating cohesion and coherence. They can in this way describe and explain complex social phenomena, such as segregation, discrimination and inequality, and provide reasons for the background and causes of these phenomena.

*Audiovisual presentations* afford flexibility in shaping representations of knowledge in a way that is not present in the essays. A general pattern that was discerned is less analysis in the audiovisual presentations than in the essays, and more emotive elements included specifically in the use of images. The merging or blend of modes in shaping and re-presenting knowledge, allow for making meaning in forms that engage the reader’s emotions and interest. The audiovisual text also allows the students to *show* by using images, rather than just to describe using verbal modes, as is the case in essays. There is also more flexibility in how to structure and orchestrate meaning with the use of multiple modes. The students have solved the construction of their audiovisual presentations in different ways, while the constructions of the essays are of the same mould, with one specific variation; Ada uses bullet points to structure her written text. The audiovisual presentations allow the students to combine, or interweave, multiple ideas in ways not possible in the linear construction of the written text. There is variation in how the students use orchestration of modes. In the same audiovisual presentation different modes can function as the main mode of communication, but on the whole speech (narration), and visual modes, images and layout, are the most dominating modes, sometimes from multiple perspectives, and writing is the least important mode in the audiovisual presentations. The students use the affordances of the audiovisual presentation in different and creative ways, but showing varying levels of creativity and re-shaping of knowledge. For example Daniel’s and Emma’s essays and audiovisual presentations show a multitude of transforming processes across the two types of text, while Ada is changing little when re-presenting knowledge across the written and audiovisual text. In the audiovisual presentations showing by using examples is an essential element in making
meaning, and shaping/re-presenting knowledge. There is also an emotional appeal achieved both through the use of selected images and examples, the narrative structure and use of simultaneous modes.

The third and last research question in this study, *how can the students’ text production be understood in terms of transduction*, is the most complex and leans on the results of and the understanding born out of the first two questions. The students worked with making essays and audiovisual presentations in a parallel process. In this situation it is not possible to study transduction unidirectionally, from one type of text to another. Transduction should here be seen as a process *across* written and audiovisual texts. However, in the theoretical framework there is an assumption of direction embedded in the concept transduction. Transduction has one material direction assuming there is “the ‘originary’ and the ‘target’ mode” (Kress, 2017, p.44). Here the study of transduction processes had to be adjusted for another situation. It had to be taken into consideration that the direction of the students’ transduction processes was unknown or possibly simultaneous. It cannot be ruled out that students had worked with the essay and their audiovisual presentation in an iterative process going back and forth between the two text types, or they could have written the essay first and then made the audiovisual presentation, or the other way round. The fact that the study was not looking at a case of transduction from one media to another but across two media, where there was no set order of production, as the students were working with essay and the audiovisual presentation in parallel, made matters of transcription and analyses more complicated. The merged transcriptions developed for this study solved this problem as the transcription format allows for simultaneous reading of the students’ transcribed essay and audiovisual presentation.

The concept transduction has a key function in social semiotic multimodality. Transduction is a process where meaning is moved from one sign system to another, and remade across modes (Culache, 2015; Kress, 1998, 2003, 2010, 2017, Poulsen, 2017). The concept of transduction is in this study used at an interpretative level in the study to understand the students’ representation of knowledge across different media (text types). Using transduction as an approach has offered the means to examine how knowledge is represented in written and audiovisual text. The analyses of meaning and transduction show that different levels of text production are interconnected in the process of transduction and that the different layers of the audiovisual and written texts support each other. The students make choices as to what to represent and how to do it. They chose what knowledge should be given shape, and how it should be shaped in essays and audiovisual presentations. This includes both what and how knowledge (ideas) should be transduced. There are qualitative differences in the students’ work where Daniel, Emma and Fanny stand out. Daniel and Emma because their texts show most transformation in the transduction. Fanny because of the dominance of the written text over the audiovisual text and in that she transfers information ‘word by word’, and uses a diverging image. Simultaneous modes can align or diverge. When modes align they emphasise the meaning or message and when they diverge they create dissonance and create double message, or different messages (Smith et al., 2016), as when Fanny choses an image that diverges from the content in the simultaneous verbal narration. Images can also be used rhetorically (Birdsell & Groarke, 2007) “to appeal to readers’ emotions or identify with the point of view of the writer” (Smith et al., 2016, p. 139), for example as when Ada uses images, which illustrate segregation in the American South with documentary photographs. Semiotic features of modes include salience, intensity, cohesion and coherence (Bezemer & Kress, 2016; Kress, 2017). This study uses two separate visualisations to study processes of transduction. One of the visualisations was used to discern how meaning was transduced and whether transferred or transformed, or in some cases not transduced at all, across idea units.
between essays and audiovisual presentations. Here salience, cohesion and coherence were noticed. The second visualisation was used to reveal intensity of the meaning transduced, and where focus was placed in the students’ representations of knowledge. The semiotic feature of intensity is essential in meaning making (Kress, 2017) and in this study it helped identify the most salient or central themes in the students’ essays and audiovisual presentations. The visualisations also helped in revealing how and if the intensity differed between the students’ representations of knowledge.

The essays and audiovisual presentations of Ada, Camilla and Emma place intensity fairly evenly distributed between several central themes, and in about the same relations across essay and audiovisual presentation. For Daniel the visualisation showed that he gives comparatively more intensity to his own reflections in his essay, although visual modes in the audiovisual presentation afford more ways of expressing emotion. Transduction involves changes in understanding. In the transduction process content, (ideas, knowledge), has to be organised in a logical (written or audiovisual) text structure to clearly communicate the meaning being made. Here Fanny’s work stands out as there is substantial discrepancy in what content and ideas are represented in her essay and audiovisual presentation and the content (idea units), which makes it hard to say anything significant about changes in understanding. However the use of an image in the audiovisual presentation that diverges from the content in the verbal modes also affects and changes understanding and how knowledge is presented. Greta places more intensity on abuse in her essay, while in the audiovisual presentation more intensity is given to society and policies, which is one of the clearest examples in this study of the changes in understanding resulting from transduction. Meaning is also created in ensembles of modes (Jewitt, 2009) where the interaction between the different modes is significant for meaning making - “the unique combination of different modes communicates messages that no single mode communicates on its own” (Smith et al. 2016, p. 139). This is the major affordance of the audiovisual medium and hence in the audiovisual presentations. Compared to the essays the audiovisual presentation used narration, and images, a less overt method, for making meaning. Contrasting examples with the use of images supplied implicit arguments or emotive positioning of the reader. In this process of transduction not only the shape and form of the information or meaning changes. There are also changes at a deeper ontological and epistemological level (Kress, 2017). Contrasting examples of how students transduce ideas across essay and audiovisual presentation, illustrate how transduction can be realised in different ways. Daniel uses narrative elements while Ada relies more on representative examples. The visualisation of transduction reveals how many of the ideas represented in Daniel’s written text were translated-transferred-transformed into some particularly rich sequences in the audiovisual presentation, while Camilla’s audiovisual presentation is partly organised after rhetorical questions. The meaning is developed stating facts, clarifying with explanations and supporting examples. Key features are transduced across the written and audiovisual texts, but the sequence and manner in which they are presented could be transformed. For example Greta keeps the general overall structure and interjects content between sequences of idea units, which are nevertheless kept together. Combining two mediums for representing knowledge offers the students more flexible ways of expressing what they know, and the teacher a wider window into the students’ knowledge (and learning). The combination of written and audiovisual texts together give a deeper sense of the knowledge represented and meaning made.

The findings of this study show that the students design their multimodal knowledge representations carefully. Deliberate choices are apparent in how they use animations and transitions for linking content at multiple and simultaneous levels. The students show awareness of meaning affected by the use of framing, colour, transitions, and animations. Descriptive content is the most common, secondly
it is the student’s feelings that are expressed, while less focus is given to problematising the issues. The students’ audiovisual presentations differ significantly in the number of images, transitions and animations included. This varies from one image with no visual linking and transitions to complex audiovisual presentations with several images of different types as well as maps and charts, or several images and complex linking using animations as visual transitional elements between slides. Many of the same ideas are found in both essay and audiovisual presentation. There is a core content transduced, but students differ in how large this core of content is. Ideas are transduced in many and varying ways across essay and audiovisual presentation. The study shows that essays afford structured and stable communication where content can be logically organised after the set logic of writing (Kress, 2010) and audiovisual presentations afford flexibility in shaping representations of knowledge. The study also shows how transduction across the written and audiovisual mediums offer possibilities of interpretation, exploring and reshaping knowledge. The analyses show that different levels of text production work together in the process of transduction and that the different layers of the audiovisual and written texts support each other. The results indicate that transduction is a reflective practice for understanding critical issues in (contemporary) society where transduction involves changes in understanding (Kress, 2010, 2017).

The results of this study are in line with Svärde-Måberg, Åkerfeldt & Selander (2013) who showed that digital tools impact on student writing processes and that both mediums and modes used for learning delimit the reach of what knowledge can be represented in a certain situations (Kress, 2003; Jewitt, 2009; Selander & Kress, 2010). This is also in line with Smith et al. (2016) who showed that essay and video came with unique affordances based on modes of communication for the communicative task at hand. In this study we can see that that different affordances of the written and audiovisual mediums shape how meaning is made and knowledge is represented, and that the process of transduction active when reshaping knowledge entails changes in understanding. Ranker’s (2015) study showed that the visual medium made it easier to represent relations between ideas and objects, which is relatable to how this study shows that audiovisual presentations afford more means of expressing emotions and flexibility in shaping representations of knowledge. The four trends Jewitt (2011) identified are reflected in this study. We see that the students in this study reconfigure “resources of communication and representation and shapes of knowledge” (Jewitt, 2011, p. 186), when they materially represent knowledge and transduce meaning across essays and audiovisual presentations. The ”weakening or fluid boundaries between specialised and everyday knowledge” (Jewitt, 2011, p. 186) can be sensed in how the students mix information they have gathered with their own everyday observations. For example when Ada places the (more specialised) information she has gathered about the black civil rights movement in the USA in relation to her own experience of racism and discrimination. The students in this study are both users and producers of knowledge, which was the third trend Jewitt (2011) identified, and we can see traces of how knowledge is modularised into chunks (Jewitt, 2011, p. 186). Although none of these trends have been the focus in this study, or are directly reflected in aim and research questions, these trends are nevertheless discernible in the empirical material and analyses. Using English as a foreign language is hampering the students’ ability to communicate in the way they would have been able to in their native language. However, the notion that they use the most apt way to communicate (Kress, 2010, 2017) still applies. One of the assumptions in this study is that communication is multimodal, and that verbal modes is only one part of a multiplicity of modes (Jewitt, 2014a, 2014b). The foreign language situation also applied to the students in Mestre-Mestre’s (2015a) study, which showed that written and visual modes complement each other and that the students relied increasingly on images as the concepts increased in level of abstraction. This is not something seen in this study, but on the other hand it has not been the purpose
of any of the analyses. There are however parallels in the results of this study with Mestre-Mestre’s (2015) results, which showed the use of different strategies for combining writing and images after what type of concept the students wished to communicate. Höglund (2017) showed that an abundance of available semiotic resources available were both a challenge and an asset for students when working in audiovisual modes (video) as they combine and juxtaposition different interpretations (Höglund, 2017, p. iv). Here the students also use different strategies for combining verbal and visual modes after what meaning they want to make. The students in Hafner’s (2014) study were non-native speakers of English. Hafner’s (2014) study showed tension between academic writing and multimodal text production. Implicitly we see parallels in the results of this study where some students, such as Fanny, appear to be heavily influenced by the logic of the written text in making their audiovisual presentations, while other students, for example Daniel, have used the affordances of the audiovisual medium in creative organisation and modal orchestration. Höglund (2017) and Smith et al. (2016) focused on processes of transduction. This study is in line with Smith et al. (2016) who showed that students transduced meaning in different and varying ways.

There were three research questions posed at the start of this study, how students make meaning and represent knowledge (about civil rights in the English speaking world) in their written essays and audiovisual presentations, what the affordances are of written essays compared to audiovisual presentations for representing knowledge (about civil rights) and lastly how the students’ text production can be understood in terms of transduction. How well has the study succeed in answering these questions? The first two question were descriptive in character. I would claim that the results show both how the students make meaning and what the affordances and constraints are of the mediums of essay and audiovisual presentation and their available modes. Results also show how the students have made use of these affordances and worked within the constraints of both mediums with their available modes. The third research questions was centred on processes of transduction. Here the study encountered problems with direction of the transduction process. In which direction should the study be done? The solution was to use the comparative framework of the merged matrices. The matrices for merged transcriptions developed for this study, made it possible in the analyses to read from the centre of the matrix and outward in two directions (figures 6 and 7). In this way it was possible to analyse processes of transduction, even though there was no certain way of knowing for any single student what the work order had been for him or her in the process of making the material knowledge representations, essay and audiovisual presentation. Yet it was possible to study the differences in modes and materiality, and to see that transduction had taken place, and thus to study it. This study has contributed knowledge about how (Swedish) secondary students make meaning in a dual and parallel process or representing knowledge in written and audiovisual text, and shed some light on transduction processes in a situation where the transduction process cannot be assumed to be unidirectional. In order for this to be possible a comparative framework for adjusted multimodal transcription was developed. This study is in line with the previous research included, but adds knowledge on how Swedish upper secondary students work with transduction across written and audiovisual modes and media when there is no presupposed order of work, or presupposed direction of transduction. The study also contributes knowledge on a ‘real life’ educational situation rather than a, for research purposes, constructed situation.
5.3 The research process

The multimodal social semiotic perspective (Bezemer & Kress, 2016; Halliday, 1978; Jewitt, 2014b, 2014c; Jewitt et al., 2016; Kress, 2010, 2017; Kress & van Leeuwen 2001, 1996/2006; Selander & Kress, 2010) was chosen because it provided tools for understanding how meaning is made and represented in the empirical material, the students’ essays and audiovisual presentations, where the students used many modes (Bezemer & Kress, 2016; Jewitt, 2014b, 2014c; Kress, 2010, 2017; Kress & van Leeuwen 2001, 1996/2006; Selander & Kress, 2010). The students were taught by me when they worked with the themed unit “Civil Rights in the English Speaking World” (appendix 2). The essay and audiovisual presentations, are the material representations of knowledge the students made in their regular and everyday context of learning and working with the subject English in school. The multimodal social semiotic framework helped when examining and interpreting the semiotic choices the students made when shaping (multimodal) text (Kress, 2010; MODE, 2012). If the lessons, which resulted in the empirical material collected for this study, had been going on as this study was carried out, there would have been a risk that the construction of this study could have affected the learning situation for the students and then also the outcome of this study. To avoid this data was collected retrospectively from the Learning Management System for groups of students who had completed and received their final grades in the course English 6 (The Swedish National Agency for Education, 2017c). This should improve the credibility of the data used, as the students cannot have been influenced by the construction of this study when they were working with their essays and audiovisual presentations. With this type of data where there are dual representations of knowledge, it was possible to analyse and interpret how the students made meaning and gave knowledge new and different shapes in two different media using two different types of text.

In this study the concept text is used to include more than writing on paper or a digital page. This widened definition of text encompasses multiple modes including but not limited to verbal (writing and speech) and visual (image, layout, colour) modes (Halliday, 1987; Kress, 1998, 2003, 2010; Kress & van Leeuwen, 1996/2006). The concepts written text and audiovisual text are used in this study for when the format or medium is discussed, while the words essay and audiovisual presentation are used for the material representations of knowledge the students make and shape. This use of two words denoting the same material artefact could be criticised. However, there is a point to using both concepts alongside the concept medium. The essay is a material product, the written text is here a type of text that uses the written mode in the written medium. Hence the use of written and audiovisual text and essay and audiovisual presentation affords a level of distinction between the material knowledge representation and what type of text is referred to. In the process of analysis there are constant choices made by the researcher, what to analyse, where to place the focus how to apply the theoretical framework and how to transcribe (Flewitt et al., 2014), as well as how to delimit the material. As a consequence there are many (possible) perspectives and methods of analysis left out, which is something Höglund (2017, p. 78) also reflects on. On this note it should be mentioned that there was no element of classroom or student interaction included in this study, nor is there any focus on the teaching that underlies the student’s work, and the content the students worked with was not the focus as such. (The study could have been done on students’ representations of knowledge made in other subjects but English). A challenge when working with digital multimodal data is to use the mode of writing for explaining other modes such as speech, image et cetera modes. The process of transcribing was in effect re-presenting the students’ representations of knowledge and giving the content new shape(s). Multimodal approaches have been criticised for being too descriptive (Jewitt 2014b, 2014c), which became a pitfall to avoid in the process of working with, and analysing, the data for this study.
Descriptions are needed, and close ‘reading’ of the students’ texts as well. The problem is to balance the descriptions against the more analytical, which in turn is based in the descriptive. The process of transcription is also a time consuming one, but on the other hand it affords the person transcribing an intimate and detailed knowledge of the texts the students have shaped, and in how they re-present meaning and give new shape(s) to what they have learned. The written mode is dominant in education (Kress & van Leeuwen, 2006), and this is reflected in this thesis in the logic and (reading) order of transcriptions and analyses, despite there being no presupposed order in the production of written and audiovisual texts. The process of transcription started with the essays and then moved to the audiovisual presentations. The reason for this was purely practical as the multimodal transcriptions are more complicated. For transcribing and being able to compare across the transcriptions of essays and audiovisual presentations) a comparative framework was needed, which was born out of necessity and with inspiration from Smith et al. (2016). No transcriptions system (University College London Institute of Education, 2012) was found to match the needs of this study and hence a transcription system (and coding) was developed, which allowed for simultaneous transcription of the parallel written and audiovisual texts the students had made. Once these transcriptions were in place the analyses across essays and audiovisual presentations were possible to carry out. The comparative transcripts and analyses place the essays on the left and the audiovisual presentations on the right but the reading order of these is from the centre and out, top to bottom (figure 4). Transcribing the empirical material is a form of transduction process (Kress, 2010) where the empirical material has been transferred, translated and transformed from two different sign systems, essay and audiovisual presentations, into a third, the multimodal transcripts. The process of transcribing also became part of the process of analysis as patterns became visible while processing the empirical material. The conceptual tool transduction (Kress, 2010, 2017; Poulsen, 2017) was needed as a help in understanding the process of re-shaping knowledge across written and audiovisual text. The preposition across is used intentionally (and with emphasis) all through this study. It is important to stress that the study does not clarify in what direction the transduction process has taken place for a particular student. The assignment the students worked with was one unit where students had to report both in text and speech but there was no order specified for what to do first. In this study the students were working in a simultaneous and parallel process of finding facts and learning about their chosen topic and then simultaneously working with writing an essay and making a (multimodal) spoken presentation. This resulted in a study where the method of transcription (description and analysis) had to take into account a process of transduction across written and audiovisual text rather than transduction from one set original medium (written text) to another target medium (audiovisual text). At this point it needs be emphasised (again) that there was nothing that hindered the students from shaping the written text first and the audiovisual text afterwards, or the other way around, but the work unit was constructed in such a way that students worked in class and with both tasks in parallel. The instructions did not specify any set order for essay and audiovisual text, and both were to be finished and handed in at the end of the work unit (appendix 2).

Meaning making is central both in multimodal social semiotics and in this study that is situated in an educational context. Learning is seen as a phenomenon, where students are re-constructing their social reality as they interpret and produce signs and make representations of knowledge. Knowledge and learning are here seen as mutually interdependent concepts (Bezemer & Kress, 2016; Kress, 2010; Kress & van Leeuwen, 1996/2006; Selander & Kress, 2010). The students’ knowledge is revealed in their material representations, their essays and audiovisual presentations. Selander and Kress (2010) state that learning is a creative action of re-shaping previous representations of knowledge. With this view learning can be seen as transformation in learning sequences, where knowledge is transformed in
a first learning sequence and then re-presented in a second sequence (Selander & Kress, 2010). The analytical focus in this study is placed between these two cycles, or in other words at the point in the process of making meaning and learning where the students are re-shaping knowledge (Kress, 2010; Selander & Kress, 2010). Instead of designing a learning situation that allowed for the study of transduction, as for example Höglund (2017) did, this study took its starting point from digital material produced by students during two years of English studies. The original empirical material already existed before the construction of this study, and was not the result the designed intent of a researcher. It was not the intent at the start of this research and writing process to adapt or modify forms of transcription, nor was the original focus transduction, but in the processes of delimitation and sorting through the empirical material, transduction became a focus area of interest for understanding the students’ meaning making in their dual representations of knowledge (essays and multimodal presentations). There are methodological problems with the theoretical framework (Halliday, 1978; Jewitt, 2014a; Kress, 2010, 2017; Kress & van Leeuwen 1996/2006), which has to do with concepts and terminology, and there not being satisfactory, well articulated and commonly used terms for the description of the entities and processes of the diverse modes which constitute the multimodal world of meaning. Nor is there a clearly articulated/delineated link of these modes, together with their semiotic features, to the general categories of the overreaching theory . . . . there is a need to understand how to account for change of meaning within and across modes (Kress, 2017, pp. 39-40).

These methodological issues become particularly apparent in this study where the framework needed to be adapted at several levels, as can be seen in the method of (comparative) description, the understanding of direction in transduction, and how processes in action are here used to describe both written and visual mediums. With the choice and focus on transduction came a methodological problem of visualising of these processes where none of the models for transcription studied (Flewitt et al., 2014; University College London Institute of Education, 2012) felt quite adequate. Part of this problem lay in the empirical material as such, where the students had not gone from one medium (such as a written text) and worked with the transduction of the content to another medium (such as film), as is the case in previous studies found in the search for background for this study (Hafner 2014; Höglund, 2017; Smith et al., 2016).

Höglund (2017) designed a study where students were ”representing their interpretation of the poetic text during a multimodal designing process, examining both the process of the students’ collective work and the digital video that they produce” (Höglund, 2017, p. iii). In Höglund’s study there is a designed intent in how the students worked, and with what, where the researcher had designed a task for the students to work with in order for her to study the process of transmediation (that is transduction). This made the direction of transduction clear and unidirectional, facilitating the study of interpretation and transduction. In the case of this study the focus was only placed on the material representations of knowledge the students had shaped, and the assignment the students had worked with was not designed with any intent of research or study. The process for making meaning and shaping these material representations of knowledge was not included, simply because there was no way to study the actual process in retrospect. Smith et al. (2016) studied transduction from essay to video, also a unidirectional order of work where students have gone from written text to audiovisual text (video). In Hafner’s (2014) study the students reported with a documentary (film) and a written report. In Hafner’s (2014) study the students first worked with making their videos and then they write their reports ”in which students draw on the same study to complete an academic writing task” (Hafner, (2014, p. 664). In Hafner’s study the students were working unidirectionally and the order of
work for the students is clearly defined, which is not the case for this study. In the process of transduction signs made in the original representation or artefact are re-materialised in a new medium (Kress, 2017). “Multimodal messages get to be transposed in different media: textbooks become animations, novels become movies, commercials become print advertisements” (Culache, 2015, p. 495), and in this study the students’ essays become audiovisual presentations, or vice versa. It cannot be ruled out that one or more of the students started with writing the essay or audiovisual presentation, halted the work with the essay and worked some on the audiovisual presentation, or vice versa. In this kind of parallel process the student(s) will have transduced parts or sections from one medium to the other in a back and forth process or movement. This is a problematic area of unknown elements in this study, which not only had to be dealt with in the whole process of transcribing and analysing the data, but has to be kept in mind when interpreting and understanding the results and for the discussion on meaning and transduction. However problematic at the start of the research process this has proven to be interesting as it is a process where the theoretical framework, and the processes and order of studying and understanding the researched material (figure 13), is reflected in the (assumed) work process of the students. In other words the students have worked in a top-down and parallel process researching their topic and going back and forth in their work of shaping essay and audiovisual presentation, just as this study started with a top-down approach to description, transcription and analysis (Kress, 2010, 2017).

![Figure 13. The process of analysis and interpretation of meaning making.](image)

When giving knowledge new shape we have to look upon it with new eyes, which leads us to understand the world in new ways. These do not have to be monumental changes, but they do occur. Hence the process of transduction involves both elements of ontological and epistemological change (Kress, 2017). As a conceptual tool transduction then enable the analyses to uncover layers of meaning making and re-shaping of knowledge, which would otherwise be hard to identify. Transduction is not only an element in the studied data, but also an element in the research process when transcribing (Flewitt et al. 2014, Åkerfeldt, 2014). In this study content was transcribed using several graphic
elements, and transcriptions change the content of the knowledge the students have re-presented, at the same time as knowledge is given new shape in the form of this thesis. The reflexive character of this process is a necessary part of the multimodal social semiotic framework used. However, it is equally necessary to be aware of the resulting ontological and epistemological changes, which are a result of interpretation of the produced data and in the process of analysis.

5.4 Future research

While evaluation or assessment has not been in focus in this study the fine grained analyses and results have made it clear that the students’ meaning making, and the knowledge they are representing, need to be understood as a complete whole. This leads to questions about assessment and evaluation of students’ knowledge. Assessing an essay is a regular and fairly straightforward process for a (language) teacher. Assessing multimodal audiovisual text is more difficult as there are no clear definitions and instructions for how to grade (yet). Assessing the complete whole of a combined task of a written and an audiovisual text then becomes even more complex. Before national education systems can properly address questions such as these, the processes of how students represent knowledge and make meaning in new digital landscapes need to be better understood. An interesting possible future study, and a continuation with further research using the comparative multimodal framework outlined here, could be to look at assessment of multimodal knowledge representations where the (traditional) written text is combined with multimodal forms of representing knowledge and making meaning. How do teachers assess multimodal text? How should it be assessed? When and if assessment requirements how will this affect the knowledge and learning? Another interesting area of future research would be to study changes in knowledge representation comparing different countries, or to set up a study where the same task (including processes of transduction) is carried out in two (or more) groups in different countries, and then adding a closer scrutiny of how cultural context and the effectuation of teaching and learning shapes the students’ work and their knowledge representations. Such a study could be carried out in the subject English as a foreign language within the EU, where there is the Common European Framework for Languages (Council of Europe, 2011), which would make it relatively easy to find groups working at the same proficiency levels. When teachers and students work from the same instructions and at comparable proficiency levels, but in different countries and cultural contexts will there be discernible differences in the shapes of knowledge students make? If so what will these be? And how can they be described, understood and explained? This leads to a final reflection for both this study and future research. With the concept transduction we assume a direction, a process that goes from one mode or medium of expression to another. When we make this assumption we are also making basic, but implicit assumptions about how students work in school (or other places). We assume that students work with one form or expression, one medium, and when and if other re-presentations are made, these are then re-materialised from one to another medium. I argue that people can (and do) work in parallel processes when writing text, making film or other forms of knowledge representation, shaping and creating in processes, which involve transduction across modes and media, but not in any clear and well defined order of work, but in flowing processes of transduction going back and forth. To study these ‘real life’ process where transduction is a part would be a challenge, but not impossible, if a comparative framework is developed further and a study is constructed, which encompasses the processes of creating representations of knowledge, and not just the knowledge representations as such as has been the case in this study.
Sammanfattning

Övergången från lärmiljöer där skrift och text på papper dominerar (Kress & van Leeuwen, 2006), till digitala lärmiljöer aktualiserar frågor kring effekterna av dessa förändringar på kunskap och lärande. I Sverige arbetar allt fler skolor i lärmiljöer där varje elev och lärare har tillgång till en egen laptop (Tallvid, 2015), vilket gör det förhållandevis enkelt för elever att skapa audiovisuella kunskapsrepresentationer. Syftet med den här studien är att beskriva och förstå sex svenska gymnasieelevers skriftliga och audiovisuella textproduktion i ämnet engelska, med ett särskilt fokus på representationer i olika modes. Tre forskningsfrågor används,

_Hur skapar elever mening och representerar kunskap (om civil rights i den engelskspråkiga världen) i sina skrivna uppsatser och audiovisuella presentationer?_

_Vad är meningserbjudandena (affordances) i skriftliga uppsatser jämfört med audiovisuella presentationer för att representera kunskap (om civil rights)?_

_Hur kan elevernas textproduktion förstås som transduktion?_

jämförande analys och visade att olika mycket av innehållet överfördes mellan uppsats och video och på olika sätt, och har bidragit med inspiration till den här studien i form av jämförande metoder och kategorisering.


Appendexes

Appendix 1: Missive

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Fullmakt

Beskrivning av studien Kunskapsrepresentationer i digital lärmiljö i engelska 5 och 6

Mitt namn är Henrika Florén och jag studerar vid Mastersprogrammet i didaktik, Stockholms universitet. Studien Kunskapsrepresentationer i digital lärmiljö i engelska 5 och 6 handlar om att undersöka hur kunskap representeras i ämnet engelska hos elever i svenska gymnasieklasser i 1:1-miljö (en dator per elev och lärare).

Syftet är att beskriva och förstå hur lärandeprocesser i ämnet engelska gestaltas i en digital 1:1-miljö. Ett sätt att göra detta är genom att studera hur lärandet realiseras. Fokus ligger på representationer av kunskap, det vill säga de arbeten man som elev producerar inom ramen för ämnet. Det kan till exempel vara texter, filmer, presentationer, muntliga redovisningar mm.

Resultatredovisning, etik och sekretess

All redovisning av resultat sker i form audiovisual text. Inga filmsekvenser visas i resultatredovisningen. När studien rapporteras och/eller publiceras aidentifieras alla deltagares namn. Alla personuppgifter och andra uppgifter som kan möjliggöra identifiering av individer kommer att behandlas konfidentiellt i enlighet med svenska Vetenskapsrådets forskningssetiska principer för humanistisk och samhällsvetenskaplig forskning (http://www.codex.vr.se/forskninghumsam.shtml)

Medverkan i studien är frivillig och deltagarna kan när som helst välja att avbryta sin medverkan.

Jag/ mitt barn namn: ____________________________ vill medverka i i studien Kunskapsrepresentationer i digital lärmiljö i engelska 5 och 6 och tillåter att det material som du producerat i ämnet engelska under tiden augusti 2013- juni 2015 används i studien.

Jag/ mitt barn namn: ____________________________ vill medverka i i studien Kunskapsrepresentationer i digital lärmiljö i engelska 5 och 6 och tillåter att det material som du producerat i ämnet engelska under tiden augusti 2013- juni 2015 används i studien samt som visningsexempel i seminarie- eller konferenssammanhang.

Jag/ mitt barn namn: ____________________________ vill inte medverka i i studien Kunskapsrepresentationer i digital lärmiljö i engelska 5 och 6.

Datum __________________    Underskrift ____________________________
(Målsmans om medverkande är under 18 år)
Appendix 2: The assignment

Civil Rights
in the English Speaking World

Outline

Part 1. Pick one area related to civil rights in the English Speaking World...
- Black civil rights,
- women’s lib,
- gay civil rights,
- civil rights of war veterans,
- civil rights of indigenous populations and ethnic groups,
- civil rights of religious groups

Part 2. Research your topic. Include...
- background and information, (Sources needed)
- compare with your own country, but this does not have to be extensive, (Sources needed)
- your own thoughts on the issue.

Part 3. Written and Oral Presentations. You can choose to make a live presentation in class or make a recorded digital presentation which you then show in class. You should also turn in a text on your topic.

Time frame: You have 5 weeks to prepare and complete this project. Presentations at the end of the 5th week.

Civil Rights

Outline

Lesson 1 - Civil Rights

1. Introduction to the work unit. Written instructions are given out, explanations, requirements and time frame etc. (see outline above).
2. Martin Luther King Jr. is a logical starting point for the project Civil Rights - In the English Speaking World. The teachers give an introduction to the Black Civil Rights Movement in the USA.
   A. Presentation Martin Luther King Jr. - Keynote, also available at: http://www.unitedkingdom/w/civil-rights-movement/h/the-black-civil-rights-movement-in-the-usa.ppt
   B. On National Geographic’s web page you can find background and vocabulary useful for studying the issue.
   C. A timeline is also useful.
   D. Martin Luther King Jr’s famous speech is easier to follow if you can also read the text as you listen.
   E. For those who want to know more - The King Center is a good place to start.
   F. National Geographic also has more material for those who want to focus on other areas of civil rights (link below).
3. Watch TEDTalks. The gay rights movement started from the civil rights movement http://www.ted.com/talks/
yavia_ricken_what_the_gay_rights_movement_learned_from_the_civil_rights_movement

For those who want to read as well as listen there is a transcript of the whole speech http://www.ted.com/talks/
yavia_ricken_what_the_gay_rights_movement_learned_from_the_civil_rights_movement/transcript

You can also read the TED Blog. What the LGBT movement learned from civil rights: Yavia Ricken at TED Blog http://tedblog.ted.com/post/yavia_ricken_what_the_gay_rights_movement_learned_from_the_civil_rights_movement/

Lesson plan for students & teacher

Please note! The lesson plan is constructed for lessons which are 90-120 minutes long. For shorter lessons the planned content needs to be spread out over five or six lessons.

Homework 1: Research your topic. Include...
- background and information, (Sources needed)
- compare with your own country, but this does not have to be extensive, (Sources needed)
- your own thoughts on the issue.

Homework 2: Written and Oral Presentations. You can choose to make a live presentation in class or make a recorded digital presentation which you then show in class. You should also turn in a text on your topic.

Homework 3: You have 5 weeks to prepare and complete this project. Presentations at the end of the 5th week.

Homework 4: Written report (text)

List of assignments (homework)

See outline and lesson plan for details

Homework 1: Research your topic. Include...
- background and information, (Sources needed)
- compare with your own country, but this does not have to be extensive, (Sources needed)
- your own thoughts on the issue.

Homework 2: Written and Oral Presentations. You can choose to make a live presentation in class or make a recorded digital presentation which you then show in class. You should also turn in a text on your topic.

Homework 3: You have 5 weeks to prepare and complete this project. Presentations at the end of the 8th week.

Homework 4: Written report (text)
Lesson 2 – Civil Rights

I. The teacher starts the lesson with asking students about their work as far.

II. The teacher introduces a short background to slavery in the USA.
   A. Watch Origins of Slavery in America [External link: http://www.history.com/origin/]
   B. Students then read the text that supplements the film (same link as above).
   C. More information can be found at [External link: http://spartacus-educational.com/]

III. The teacher introduces a short background to Australia’s Stolen Generations. The term “Stolen Generations” is used for Aborigine people forcefully taken away (stolen) from their families between the 1890s and 1970s, many to never to see their parents, siblings or relatives again. Because the period covers many decades we speak of “generations” (plural) rather than “generation”.
   A. A guide to Australia’s Stolen Generations [External link:]
   B. Also watch (if possible) a short extract from the motion picture Australia, where the key Norah is taken.

IV. Continue with a group activity.

   Group activity (in class): In groups of 3-5 students discuss and compare the different issues of slavery in America and The Stolen Children in Australia.

   Hand in: Either take notes or make a recording of your discussion and hand in before the end of the lesson.

V. Students continue their work with researching their chosen topic. Save the search results and add these to the document ‘list of sources’ already set up.

VI. The teacher shows students how to use the Harvard Generator [External link: http://www.harvengenerator.com/ for referencing web sources. Just cut and paste by [name].

Extra: The motion picture Australia (with Nicole Kidman and Hugh Jackman) [External link: http://www.imdb.com/title/tt0465184/] can be watched with this project and the situation of the child Norah discussed and analysed as an example of one ‘Stolen Child’.

Homework for next lesson:

Homework 1: As preparation for next lesson - choose one area of Civil Rights and start looking for information. Your choice should be set before next lesson. Turn in your chosen topic to your teacher and your list of sources so far. Name your document ‘Civil Rights, references, class, year’.

Homework 2: Hand in a document with your list of sources in proper format using the Harvard Generator [External link: http://www.harvengenerator.com/ for referencing. Name your document ‘Civil Rights, references, class, your name’.

Lesson 3 – Civil Rights

I. The teacher starts the lesson with “How to make a speech”.

II. How to Do a Presentation in Class [External link:]

III. Students start preparing their speech. Use the General Writing Outline (p.) (See instructions above)

Homework for next lesson:

Homework 3: Finish your presentations so that you can present next lesson.
Lesson 4 - Civil Rights

I. Student presentations

II. After all presentations are done, the teacher gives individual feedback on the presentations. While this is going on students also work with general language proficiency (grammar, vocabulary etc.) using workbooks or online exercises.

A. Grammar: https://internetochalt.wordpress.com/literatur/engelsk/english/grammar/

B. Exercises & Resources: https://internetochalt.wordpress.com/literatur/engelsk/english/resources/

Homework for next lesson:

Homework 4: You should also report your work in the form of text. This essay should cover the same topic and using the same references as your oral presentation. For structuring your text use the General Writing Outline (p. 10, below).

Making an Oral Presentation

When making an oral presentation in class, you must know your subject well and convince your audience that they have something to gain from listening to you. Here are some things you can do to make an effective oral presentation.

- Be prepared.
- Know your audience.
- Be positive.
- Don't read your presentation. Talk to your audience. Use your notes as prompts as needed.
- Provide examples.
- Use visual aids. Visuals are supplements to what you say, not replacements for what you say.
- Maintain eye contact. Shift your eye contact around the room so that everyone feels that you are talking to them.
- Use your voice effectively. Vary the tone of your voice. Be positive and careful not to talk too quickly.
- End on a high note. Leave your audience feeling upbeat about what they have just heard.

General Writing Outline

Good planning always lies behind a well-written text.

- Welcome any ideas on the topic at hand.
- Write them down as they appear. [Brainstorming]
- Read them through. Which are relevant? Who is the receiver of the text?
- What is the object of the text? Should it amuse, inform, argue? These what is unreasonable.
- Decide in which order the relevant ideas are to be used.
- How to best start and conclude the text?
- Write a draft first, then read it, revise it and make a final copy.

Introduction: The first paragraph. Here you catch the reader's interest, and explain the topic of the text. One way of beginning is to make a bold and controversial statement or with an open question.

Main Part: usually of 2-4 paragraphs long. Be explicit and easy to follow.

Deal with one thing at a time. Use links between thoughts and arguments. This makes the text easier to read.

Conclusion: The final paragraph. Here you put together the message of your text. Be explicit and clear to make the reader remember your text and its message. strive to connect the introduction with the conclusion. If the text started with an unanswered question, give the answer in the conclusion.

Useful linking expressions: to begin with, secondly, furthermore, in addition, on the other hand, however, contrary to, in spite of, although, even though, finally, in conclusion.

Instructions for References

List of sources


This will give you links and other sources in correct format after the Harvard referencing system.

An example:


Note:

There are different systems for referencing. Harvard referencing however is one such system widely used.
List of Links • Civil Rights

Australia:
Australians: [Link]

Black Civil Rights:
- Proliferation Martin Luther King Jr. Keywords: [Link]
- Martin Luther King Jr’s famous speech (video) and text:
  - The King Center
- Origins of Slavery in America: [Link]

More Civil Rights:
- National Geographic:
  - TEDTalk: Yoruba Richen: What the gay rights movement learned from the civil rights movement [Link]
  - Transcript of the whole speech [Link]

TEDTalk, What the LGBT movement learned from civil rights: Yoruba Richen at TEDxNYC [Link]

The End of the Work Unit: Civil Rights in the English Speaking World

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by Henrika Flanin

Presentations:
How to do a Presentation in Class: [Link]
How to reference:
Harvard Generation: [Link]

Other resources:
Exercises & Resources: [Link]
Grammar: [Link]