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The PhD project was conducted in collaboration with DR (Danish Broadcasting Corporation) and Hanne Pedersen of The Animation Workshop (TAW). TAW is a professional animation school that offers workshops for children and teenagers. DR joined the field study as an observer and published the resulting learning materials based on the PhD project on a Web site, *AnimationsØen* (*The Animation Island*), with interactive learning materials and multimedia historic footage on Danish animation history, theory and production, as well as the films made during the case study. The Web site production was supported by a grant from the Danish Ministry of Education (*programstøttemidler*). DR served as editor and materials were developed by me, with collaborators Jannie Dam and Samuel Ben Israel and with input from Christian Brund Engel (see: www.dr.dk/gymnasium).

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Summary of the Thesis

We are witnesses to a paradigm shift towards increasingly visual modes of communication. This shift gives rise to venues for the authorship of multimedia and multimodal texts, a term that refers to text as incorporating different modes, including written words, sounds and images (Kress & van Leeuwen, 2001). The pervasiveness of images today is related to the ease with which we can edit and remix them with digital software and distribute them, e.g., via YouTube. Reports indicate a great variety in how young people take to digital technologies and use them to create multimodal texts (see, e.g., Loveless, 2007). However, there is little research on how young people actually utilize the opportunities for designing (or authoring) multimodal texts, such as films, outside of school and how these opportunities relate to designing multimodal texts in school.

In this PhD thesis, I examine how designing one's own films engenders reflection across the arts, media and other disciplines. The core in this thesis is a case study to determine how young people develop competences through their experiences with digital and physical media, specifically exploring how students design and produce short animated films. The data were collected from 21 students in a required art class. The students were approximately 18 years old and in their last year (2005-06) of upper secondary school in Copenhagen. The one-week program was set up expressly for this study in collaboration with an art teacher at Christianshavns Gymnasium and a guest teacher in animation. The case study concerns the filmmaking process, the resulting films and interviews with students about their art, media and general cultural background.

The aim of my study is to contribute to efforts within empirically based media and art educational research. The goal of my research is to understand learning in light of the prevalence of multimodal communication (Kress, 2003). The theoretical perspective is social semiotic, i.e., language evolves through the interactions of those who use and invent it. I discuss the concepts of literacy and competence based on a notion of design as related to reinventing and "making language" (Kress, 1997: p. xvi). I explore examples of multimodal design from the case study and discuss how the design process may lead to increased cultural, creative and reflective competencies for the designers.

I create a model, called Animating Symbols, of the interaction between reflecting and designing as a learning process, i.e., the interplay between inner thinking and the outer representation. Both reflecting and hands-on designing experience are necessary and equally important for learning.

The thesis is organized into three sections:

I. Introduction and theory
II. Methodology and data analysis
III. Conclusion and implications

In the first section, I present relevant theories on learning and on the representation of meaning in communication, particularly concerning films. This section includes a presentation of the background for the central research interest and a review of recent literature on media and filmmaking production by young people.

Learning theory is related to notions of interpretation and reflection, both critical and aesthetic aspects, and to the semiotic processes of design and production, drawing on social semiotics (Kress & van Leeuwen, 2001; Kress, 2003; van Leeuwen, 2005) combined with cultural perspectives on media literacy (Burn & Durran, 2007). The use of learning theory draws on the experiential approach of pragmatism, particularly the work of John Dewey (1934). One important notion for Dewey's understanding of the learning process is hindrances to learning, because learning is not exclusively a positive construct (1938). The notion of semiotic tools is also reviewed (Wertsch, 1998).

Social semiotic theory on representation refers mainly to external semiotic processes with signs. This theory is presented and applied to animated films. Modern digital animation is reviewed as an example of new hybrid forms of multimedia and film production, i.e., physical and virtual animation are blending. Culture is discussed as providing people with the "symbolic systems" for inventing language. Making narratives is considered a basic drive for individuals in relation to an ongoing meaning-making process in the context of our culture (Bruner, 1990, 2006).

Theories on dialogic learning are also considered, referring to a Bakhtinian idea of the interanimation of voices (Wegerif, 2008) or the continual dialogue within texts, between people and with previous works and authors. A similar idea is resemiotization (Iedema, 2001, 2003), which relates to how an author uses "semiotic resources" to enact an intention in a particular context.

At the end of Section I, the reader will find discussions on the topics of multimodality, design, agency and reflective thinking as recursive process.

The second section contains the methodology and methods for collecting and analyzing data, followed by the presentation and analysis of the actual data. The discussions of the overall methodology include how to consider both the students' films as texts and the students as individuals with experiences from different cultural contexts. During the filmmak-

ing process, individuals interact with the texts as a part of a social discourse. This interaction influences the final product as well as the learning experience.

Methodologically, the study applies data analysis methods derived from theories of discourses as social action. The study involves making a methodological toolbox for collection and analysis that extends beyond verbal and textual analysis to include embodied forms of communication (such as gesture). Analysis of data is based on mediated discourse analysis (Scollon & Scollon, 2004) as a framework for multimodal analysis of social interactions, where the process of filmmaking is seen as a nexus of roles, experience and discourse. This approach seeks to account for how people use multiple modes of communication and how people *take roles* (Goffman, 1981). Collection methods are inspired by ethnographically oriented design, art and educational research. Methodological discussions include how to analyze visual communication with methods from visual semiotics and iconography, and how to show that signs change meanings over time and in specific cultures.

In the case study, I highlight five students' discourses from two film groups, along with the resulting films. The data on these students' semiotic processes and their reflections are broken down into three components for analysis: filmmakers, filmmaking and films. Thereby, the three chapters with data are organized as follows.

In Chapter 7, I present portraits of the five students. The portraits include data from interviews with the students about their art, media and general background, the students' own photographs and films, and their reflections on the week-long animation experience. There is a discussion of the roles and interaction order in the film groups.

In Chapter 8, I present the filmmaking as semiotic processes and explore the discourses in the classroom through selected moments of filmmaking. The data include transcripts of how the students discuss and compose storyboards. My analysis concerns how and why they change their ideas during the week of filmmaking. This chapter traces three different but related semiotic processes as "windows" of the students' actions during filmmaking. These windows show how students: (1) compose their initial ideas on a storyboard, (2) change ideas during production with the help of software and other semiotic tools, and (3) discuss their ideas in a classroom critique in the last phase of film editing.

In Chapter 9, I present and analyze the students' films and synthesize the data. First, I present a formal analysis of the two animated films. Secondly, I sort the data into three categories: identity exploration, interpretation as a dialogical process and experimenting with semiotic tools. Thirdly, I discuss the pedagogical implications, including considerations about film production in school contexts. The students' learning process is discussed with attention to how some of the students misunderstood animation design and production.

This is demonstrated to be due to the students' prior experience with virtual animation and miscommunication between teachers and students.

The third section contains a review of the central themes of the research study, a critique of the study, a discussion of the limits of the study and a discussion of its contributions. I identify contributions to three areas: input to the academic debate about multimodal competence that emphasizes design, my methodological toolbox, and practical applications to support teaching on filmmaking.

Multimodal design competence is discussed in regards to the following three aspects:

1. *Cultural*—concerns how the individual develops an understanding of self in relation to others, to culture and to history.
2. *Creative*—refers to designing as a semiotic process of reinventing language.
3. *Reflective*—concerns the inner, cognitive processes that are interacting with the outer representations. Reflective processes refer here to the aesthetic aspects and critical dimensions of reflecting on others, texts and self. The aspect of reflection includes the roles or division of labor in the film groups.

The thesis concludes with implications of the study, including questions of enhancing creativity, influencing educational policy and ethical issues about self-realization in school.

The PhD project was conducted in collaboration with two partners: DR (Danish Broadcasting Corporation) and The Animation Workshop (TAW). The PhD study led to the production of *AnimationsØen* (*The Animation Island*) on DR's Web site for upper secondary schools (see www.dr.dk/gymnasium), which includes multimedia clips on animation (from DR's media library), theoretical perspectives on animation and a teachers' guide (Frølunde et al., 2007).

Selected stills from video data are presented in the thesis.

The two animated films made by the students can be viewed on:

http://stream.dpu.dk/public/lif/metamorphosis.wmv

http://stream.dpu.dk/public/lif/outbreakers.wmv

A full appendix of video data, etc., the contents of which are listed at the end of the thesis, is available on DVD only to the thesis committee.

Danish summary (Dansk resumé af afhandlingen).

Vi er i øjeblikket vidner til et paradigmeskift, hvor de visuelle kommunikationsformer gradvist overtager. Dette skift medfører øgede muligheder for at forfatte 'multimedie-' og 'multimodale' tekster. Multimodalitet refererer til et udvidet tekstbegreb og anvendelsen af de forskellige modaliteter, dvs. det skrevne ord, lyd og billede i kommunikation (Kress & van Leeuwen, 2001). Billeder anvendes overalt, blandt andet fordi det er blevet nemt at redigere, at 'remixe', og sprede dem, for eksempel via webtjenester som YouTube.

Rapporter om unges brug af medier indikerer stor diversitet i måderne unge anvender digitale teknologier til at skabe multimodale tekster (se eksempelvis, Loveless, 2007). Der mangler nærstudier af hvordan unge faktisk bruger mulighederne for at designe (eller forfatte) multimodale tekster, herunder film, i fritiden. Denne ph.d. -afhandling er resultatet af en undersøgelse af hvordan en gruppe gymnasielever designer deres egne animationsfilm.

Det empiriske studie er centralt i denne afhandling, som blandt andet indeholder beskrivelser af de unges kreative proces og forholdet mellem det at erfare og at reflektere, forstået som en kompleks proces der bl.a. omfatter evner i at tænke på tværs af genrer og fag og kombinere traditionelt adskilte områder som kunstarterne, medier m.m. Formålet er at forstå hvordan en gruppe unge gymnasieelever udvikler kompetencer gennem kreative erfaringer med digitale og fysiske medier, specifikt ved at undersøge hvordan de unge elever designer og producerer korte animationsfilm. Dataindsamlingen omfattede 21 elever i faget billedkunst, der på det tidspunkt var obligatorisk. Eleverne var omtrent 18 år og i starten af 3.G. De deltog i en film-workshop, som var iværksat i forbindelse med nærværende afhandling i samarbejde med en billedkunstlærer på Christianshavns Gymnasium og en gæstelærer i animation fra Animationsværkstedet. Det empiriske studie omfatter filmskabelsesprocessen, de resulterende film og interviews med eleverne om deres kulturelle baggrund, herunder specielt deres præferencer inden for kunst og medier.

Mit overordnede mål med studiet er at levere empiri-baseret forskning om medie- og billedpædagogik med henblik på at forstå læring i lyset af den stigende brug af visuelle virkemidler i de multimodale former for kommunikation (Kress, 2003). Det teoretiske perspektiv er primært hentet fra social-semiotikken, hvor sprog er set som en evolutionær proces der foregår i interaktionerne mellem dem der bruger, og derved opfinder, sprog. Jeg diskuterer teorier og termer som 'literacy' og 'kompetence' og argumenterer for en forståelse af design som er baseret på at opfinde og skabe sprog, eller med andre ord: "making language" (Kress, 1997: p. xvi). Jeg undersøger eksempler på multimodale designkompetencer fra det empiriske studie for at demonstrere hvordan en designproces førte til udvikling af kulturelle, kreative og refleksive kompetencer for designerne.

Afhandlingen indeholder en model for animation af symboler kaldet 'Animating Symbols' som jeg har lavet for at skitsere interaktionen mellem at reflektere og designe i en læringsproces, dvs. dynamikken mellem den indre kognitive proces og den ydre repræsentation i form af tegn. Det at reflektere over og at erfare sanseligt i en designproces er set som parallelle og har lige betydning for det at lære.

Afhandlingen er i tre dele:

I. Introduktion og teori
II. Metodik og dataanalyse
III. Konklusion og implikationer

I den første del præsenterer jeg relevante teorier om læring og om hvordan mennesker præsenterer ideer i kommunikative processer og tekster, særligt i forbindelse med film. Denne del indeholder blandt andet en gennemgang af baggrunden for min forskningsinteresse og en kort gennemgang af nyere forskning inden for området 'unges medie- og film produktion'.

Læringsteori er præsenteret i forhold til begreber om udvikling af evner i fortolkning af tegn og kognitive, refleksive processer, hvilket omfatter både kritiske og æstetiske aspekter af design og produktion af multimodale tekster. Mit afsæt er en kombination af 'Social Semiotics' (Kress & van Leeuwen, 2001; Kress, 2003; van Leeuwen, 2005) og kulturelle tilgange til 'media literacy', i høj grad inspireret af engelske traditioner (Burn & Durran, 2007). Desuden er mit syn på læring baseret på pragmatisk læringsteori og erfaringspædagogik, i særdeleshed John Deweys bidrag. Hans analyse af æstetiske læreprocesser (1934) og begrænsninger af læring (1938) er fremhævet i afhandlingen fordi jeg ikke betragter læring som et udelukkende positivt begreb. Derudover præsenterer og diskuterer jeg semiotiske værktøjer (semiotic tools) (Wertsch, 1998).

Social-semiotikken er det teoretiske fundament for min forståelse af observerbare, ydre semiotiske tegn og kreative processer, som jeg præsenterer og anvender til analyse af to af elevernes animationsfilm. Udviklingen indenfor moderne, digitale animationsfilm er kort skitseret som et eksempel på nye hybridformer for multimedie- og filmprodukter og produktionsprocesser, hvor den fysiske og virtuelle animation smelter sammen. Jeg tager den sociale og kulturelle tilgang til semiotik op i forbindelse med hvordan fortællinger kan give mennesker systemer af symboler, som vi fortolker og komponerer i vores sproglige udtryk. Det at lave fortællinger er betragtet som en menneskelig drift i vores kommunikation med andre, og som del af en udvikling af selvet i samspil med vores omgivende kultur (Bruner, 1990, 2006).

Desuden er dialogiske teorier om læring taget op, fordi teorierne handler om samspillet mellem selvet og kulturen, internt i tekster og mellem tekster som en dialogisk proces. Et relevant begreb er Bakhtins idé om mangfoldige stemmer, eller 'interanimation of voices' (Wegerif, 2008) hvilket er beslægtet med idéer om resemiotisering (Iedema, 2001, 2003).

I slutningen af den første del af afhandlingen, finder læseren diskussioner angående emnerne multimodalitet, design, ageren og rekursiv (selv-)refleksion.

I den anden del af afhandlingen fremlægger jeg metodologiske overvejelser og metoder for dataindsamling og –analyse. Derefter følger en gennemgang og analyse af de indsamlede data. Diskussioner af metodik omfatter forskningskriterier, og spørgsmål om hvordan jeg behandler elevernes film som tekster og hvordan jeg ser eleverne som individer der besidder erfaringer fra et bredt spektrum af forskellige kulturelle kontekster. I løbet af en filmskabelsesproces er de individuelle elever i en interaktiv og konkret gruppeproces med deres egne tekster, og samtidig er de deltagere i en social diskurs på et mere abstrakt plan. Disse interaktioner påvirker det konkrete produkt såvel som læringsprocessen og den opnåede erfaring.

Den metodologiske tilgang stammer fra diskursanalyse, som også inspirerer socialsemiotik. I forbindelse med feltstudiet, har jeg sammensat og udviklet en metodologisk værktøjskasse til at indsamle og behandle typer af data, som går udover verbal og tekstuel analyse, og blandt andet omfatter kropslig kommunikation (eksempelvis gestik). Analysen af filmproduktion som gruppearbejdsprocesser er inspireret af 'mediated discourse analysis' (Scollon & Scollon, 2004) som en ramme for en multimodal analyse af de sociale interaktioner, herunder hvordan en arbejdsproces ses som en smeltedigel af roller, erfaringer og diskurser. Ved hjælp af denne tilgang undersøger jeg hvordan mennesker bruger mangfoldige modaliteter i kommunikative processer og hvordan vi antager forskellige roller i forhold til hinanden (Goffman, 1981). Dataindsamlingsmetoden er inspireret af en etnografisk tilgang til design, kunstnerisk og pædagogisk forskning. Diskussioner om min metodologi omfatter blandt andet spørgsmål angående analyse af visuel kommunikation med metoder fra både visuel semiotik og ikonografi, og anskuelser om behandling af tegn med forståelse for at tegn forandrer betydning over tid og i forhold til lokale, specifikke kulturelle sammenhænge.

I fremlæggelsen af data fremhæver jeg fem udvalgte elevers diskurser og deres animationsfilm. De fremlagte data om elevernes semiotiske processer og deres egne refleksioner om erfaringerne er opdelt i tre analytiske kategorier: 'filmmagere', 'filmskabelsen' og 'filmene'. Det fører til tre kapitler, som indeholder præsentation og analyse af data:

I kapitel 7 præsenterer jeg portrætter af de fem elever. Portrætterne omfatter data med udgangspunkt i interviews med eleverne om deres kunst, medier og generelle baggrund, samt deres egne fotos og animationsfilm og deres refleksioner om den uge-lange animationsworkshop i skolen. Jeg analyserer og diskuterer deres indbyrdes roller, deres 'interaction order', i filmgrupperne.

I kapitel 8 præsenterer jeg filmskabelse som en semiotisk process og udforsker diskurserne i klasseværelset gennem nogle få udvalgte sekvenser i gruppearbejdsprocesser. Jeg præsenterer både visuelle data og transskriptioner af hvordan elever taler, gestikulerer mm., blandt andet eksempler der viser hvordan de udvikler deres storyboards (skitser til film). I min analyse er mit hovedfokus hvordan og hvorfor eleverne forandrer deres idéer i løbet af filmskabelsesprocessen. Dette kapitel følger tre forskellige, men beslægtede, semiotiske processer som 'vinduer' til at fastslå elevernes forskelligartede interaktioner i filmskabelsesprocessen. Disse tre vinduer viser hvordan eleverne: (1) komponerer deres spæde idéer på deres storyboards, (2) forandrer deres idéer undervejs i produktionsprocessen ved hjælp af software og andre semiotiske værktøjer, og (3) diskuterer deres filmiske idéer og modtager kritik i en fremlæggelse i klasseværelset i den sidste filmredigeringsfase.

I kapitel 9 præsenterer jeg min analyse af elevernes film og laver en syntese af datatyperne. Først præsenterer jeg en formel analyse af de to udvalgte animationsfilm. Dernæst sorterer jeg data i tre analytiske kategorier: identitet som en udviklingsproces, fortolkning som en dialogisk proces og praktisk afprøvning af semiotiske værktøjer. Til sidst i kapitel 9 diskuterer jeg de pædagogiske og didaktiske implikationer, som omfatter betragtninger om filmproduktion i en skolekontekst. Elevernes læreproces er lagt frem til diskussion med særlig vægt på det problem at nogle af eleverne misforstår animationsdesign og -produktion. Jeg demonstrerer at det er på grund af elevernes tidligere erfaringer med virtuel animation og en delvis fejlslagen kommunikation mellem lærere og elever.

Den tredje del af afhandlingen indeholder et resumé af de centrale temaer i undersøgelsen, en kritik af studiet, samt en diskussion af dens begrænsninger og bidrag. Jeg peger på bidrag inden for tre områder: (1) til den akademiske debat om multimodal kompetence der fremhæver design som aktiv handling, (2) min metodologiske værktøjskasse, og (3) de praktiske muligheder for at understøtte undervisning om film og filmproduktion.

Multimodal designkompetence er diskuteret i forhold til tre aspekter:

1. *Kulturelle*—retter sig mod hvordan individet udvikler en selvforståelse i relationerne med andre, med sin kultur og historie.

2. *Kreative* – refererer til det at designe som en semiotisk proces hvor mennesker skaber og opfinder sproglige udtryk.

3. *Refleksive* – handler om de indre, kognitive processer der er i en stadig, kompleks interaktion med de tegn vi producerer og omgiver os med. Refleksive processer refererer til æstetiske så vel som kritiske aspekter af dét at kunne tænke over andres fortolkninger af en tekst, mulige betydninger i tekster, og ens selvforståelse. Det refleksive aspekt omfatter også indbyrdes roller og opdelingen af arbejdsopgaver i filmgrupperne.

I de afsluttende kapitler med konklusioner og implikationer samler jeg op på de indledende begreber om 'media literacy' og kompetence som et potentiale. Jeg stiller spørgsmål angående udvikling af kreativitet, uddannelsespolitik og etiske problemer i forhold til 'selvrealisering' i skoler.

Ph.d. projektet blev udført som et samarbejde med to partnere: DR og Animationsværkstedet TAW. Ph.d. studiet førte til produktion af *AnimationsØen* på DR's website for de gymnasiale uddannelser (se www.dr.dk/gymnasium), hvor der er publiceret videoklip om animation (fra DRs mediearkiv), historiske og teoretiske perspektiver om animation og en lærervejledning (Frølunde et al., 2007).

Udvalgte stills fra de empiriske data er vist i afhandlingen.

De to korte animationsfilm lavet af eleverne kan ses i 2009-10 på:

http://stream.dpu.dk/public/lif/metamorphosis.wmv

http://stream.dpu.dk/public/lif/outbreakers.wmv

Et bilag på DVD er forbeholdt bedømmerne.

Section I: Introduction and Theory

1. Introducing the Study

Chapter 1 provides an overview of this project's research problem and its relation to social issues, educational issues, and similar fields of research. It also presents the structure of the thesis and describes my journey with the PhD project.

Chapter 1 opens with a presentation of the wider background for the central research area. I introduce the main research topic and theories related to the representation of meaning in signs and symbols, extending to relevant issues in culture and technology. Next I formulate the research question and discuss my focus on students as designers and filmmakers in the empirical study. I elaborate further on the research question by presenting my model for understanding the developmental process of learning through designing texts and reflecting on texts, Animating Symbols (Figure 1.1). The model refers to cognitive models, traditions of literacy, and definitions of competence. I then provide more information on the terms *designing* and *reflecting* and introduce the theoretical notion of transformation. However, theory is discussed at length in future chapters. Chapter 1 includes an overview of the methodology for addressing the research question and a review of the fields of study and practice that address designing and reflection from the standpoint of learning. I discuss previous studies in the field and their limitations. Following the review, I switch briefly to a focus on my own process. I offer some information on my background and describe the conditions that led to this research project and topic. Chapter 1 ends with an overview of the thesis structure.

1.1. The Background for the Research Topic

Our era has been described as undergoing a paradigm shift, adopting an increasingly visual mode of communication or experiencing a visual turn, because our culture is undergoing a visual, pictorial "iconic turn" (Mitchell, 2005, p. 5). The pervasiveness and quantity of images are new, and there are many new opportunities for authoring multimodal texts by using digital tools for copying, recombining, and disseminating our own texts. The research topic is rooted in the desire to address the phenomenal rise of visual communication in the mass media from young people's perspective.

My specific interest is to examine how young people are designing their own films with multiple modes as a process of learning. I aim to explore how this "designing" can promote their thinking about multimodal texts, such as films. (From this point on, I will use the term *film* instead of *movie*.)

The background for the research topic stems from the everyday learning of young people with multimodal texts, especially their design (authorship) of texts, such as the short animated narratives analyzed in this case study. The term *multimodal* refers to a social, semiotic theoretical approach in which designing a multimodal text refers to an expanded notion of text across different modes (Kress & van Leeuwen, 2001; Kress, 2003; van Leeuwen, 2005). Two key theoreticians in the area of multimodality (social semiotics) are linguist and educator Gunther Kress at the University of London's Institute of Education and Theo van Leeuwen at the University of Technology, Sydney, who has a background in film and combines linguistic analysis with visual communication.

The key notions from social semiotics that apply to this study are the idea of "designing" multimodal texts, rather than writing, which concerns mainly written words; and the idea of how meanings are represented, and in which modes. A mode can include sound, written words, spoken words, and images. Kress (1997) emphasizes a future where design relates to "making language" (p. xvi). Design concerns the remaking of language in its multimodal forms. Language evolves through the interactions of those who use, reuse, or invent it.

My goal is that this study contributes to research in empirically based language, media, and art that is intended to examine learning in light of the prevalence of multimodal modes in our contemporary communication. My case study is a basis for exploring examples of multimodal design and discussing how such design could assume a kind of literacy or competence. However, the notions of literacy and competence are contested, so it is imperative to examine the notions theoretically to qualify my argument. Though I introduce a few points in this chapter, literacy is treated more comprehensively in Chapter 2.

My research approach stems from speculations about how schools can best educate and shape young people who are growing up in the so-called "digital generation," in the midst of a visual turn. I refer also to the influence of a multimodal mass media outside of school, especially its influence on young people. In addition, I discuss the implications of the multimodal concept in terms of changing work life and society as a whole. I draw from learning theorists to clarify the overarching challenges to education. For instance, Kress (2003) calls for a reconsideration of how we learn with multiple modes of communication and how we can apply multimodality to education.

1.2. Presentation of the Research Problem on Learning

Learning, my primary topic, refers to the transformation of thinking and designing representations in multimodal texts, such as films. Learning is examined in the context of an

upper secondary school classroom in Copenhagen, encompassing 21 students (18 years old) who are attending a week-long workshop on animation filmmaking.

The research problem addresses how these students design meanings with signs and symbols: how they transform, or animate, symbols and signs, as well as how symbols and signs become "animated symbols" in the sense that symbols may seem to become more alive in an active process of design. This double process is referenced in the title of this dissertation as well as in the model Animating Symbols. I examine the processes of learning as interconnected with processes of transformation; I draw mainly on social semiotics and pragmatism to highlight the "double process" of transformation (Kress, 2003; Dewey, 1938). The term *double* refers to both the interaction of the signs and symbols that are transformed into texts, and the humans who transform signs and symbols in our thinking.

This study departs theoretically from the social semiotic tradition. I incorporate the pragmatic approach to learning to support my claims about learning, since social semiotics is not necessarily concerned with learning (Kress & van Leeuwen, 2001). I draw my terminology from social semiotics, which I apply with related pragmatism-based learning theories on the relevance of designing or articulating meanings (Dewey, 1934, 1938) and a few notions on narratives and cognition (Bruner, 1994).

I also refer to cultural studies traditions that have been applied to art and media education for young people (Willis 1990, 2000; Buckingham et al., 1995). I aim to use the cultural perspective to address the gaps in connecting learning and semiotics and to spark a dialogue with similar attempts at combining theoretical perspectives on learning and representation.

In order to more fully understand the data I derived from the students' concrete actions of filmmaking, I apply the methodology of mediated discourse analysis (MDA) by linguists and ethnographers Ron Scollon and Suzie Wong Scollon, introduced in 1.5.2 and laid out in Chapter 5. MDA as a methodology refers largely to social semiotic theory and pragmatism; it helps me integrate filmmaking with learning. MDA also refers to sociocultural theories of learning (Vygotsky, 1978, 1986; Wertsch, 1991, 1998, 2002), but I mainly use the notion of "mediated action."

My synthesis is discussed in Chapter 4 and in an ongoing fashion.

This study relates to other empirical studies that apply the social semiotic perspectives on films as texts (Kress & van Leeuwen, 2001; Burn & Reid, 2001; Burn & Parker, 2003; Frølunde et al., 2008). I discuss gaps and review influential work further in the literature review in 1.6.

1.2.1. Introduction to the main topics.

Learning relates to how humans develop through complex processes of communicating with one another, and we "learn" to use available signs and symbols to convey meaning. Communication is a process of making meaning, or semiosis, that relates to processes of language development, as theorized in social semiotics (Halliday, 1993; Kress, 2003). This notion of language encompasses a wide range of human communication methods, including visuals, the written alphabet, and movement. Humans use all available resources to communicate, including the different specific communication modes such as speech, drawn figures, and so on.

The social semiotics approach is a synthesis of theories, including inspiration from the holistic, pragmatic view of learning developed by American educator, psychologist, and philosopher John Dewey (1859–1952). Dewey's theories of experience, interaction, aesthetics, transformation, and reflection contribute to my central concepts of learning (Dewey, 1933, 1934, 1938) and have influenced many contemporary educational researchers (see Chapter 2). The pragmatic roots of social semiotics facilitate my understanding of the experiential learning process behind film design. Through Dewey's pragmatic view of "art as experience" (1934), and of uniting notions of doing and reflecting (1938), I find a way to conceptualize concrete action and abstract thought as double processes that are inseparable in the realm of learning.

I frequently use two words to refer to a united, intertwined learning process: designing and reflecting. Designing is my preferred word for actions that refer to composing text, which is similar to the notion of writing (as in writing words in an essay). Reflecting is my preferred word for what is essentially thinking in regards to the meanings of texts; it is related to interpreting.

Designing involves the concrete act of choosing particular signs and symbols to represent an idea; for example, one of the study's film groups represents meaning by using a laurel tree, a sign they intend to refer to an ancient Greek myth (Ovid, 2000/original 8). Based on this and other examples from my data, I question how the students use representations and how much they understand that all representations are designed with intent—by someone, for someone else, and for some purpose. The students' work as designers involves designing-related actions that relate to "reflecting" on symbol systems in other texts. So learning is treated in two ways: how the hands-on experience of designing texts develops learning, and, dynamically, how reflecting as a thinking process develops through designing. The data presentation includes analyses of animated films as texts and of the process of designing the texts. Reflecting includes actions of interpreting, evaluating, altering, and discussing texts, which I consider indicative of "thinking" processes (Dewey, 1938; Bruner, 1990).

Reflecting is a difficult notion to apply theoretically and methodologically because it is hypothetic; thinking is an internal, intangible process. In educational policy, reflection is often connected to the term competence, but it is highly complex theoretically. Understanding the reflective process is one of the problematic gaps in empirical research on learning (for example, see Rattleff, 2006). Devising a working notion of reflection poses many challenges. In my attempt to address this gap, I rely on a model for understanding people's "thinking" processes when they design symbols. With reference to my model, I postulate about how the students are "thinking." See further discussion in 1.3.4 and other conceptual models of reflection presented in Chapter 4.

I next discuss culture, a secondary topic of this thesis. I see the students' films and filmmaking as influenced by their culture and as examples of learning how to communicate. My cultural position is rooted in my interest in the current shifting in forms of communication in everyday life. A mainly monomodal form of text (i.e., the written text) has had importance in school, but is now challenged by the rise of multimodal forms of texts in society at large (for instance, communication via the internet). As a result, I look broadly at schooling practices within the overall culture of school and take a social and cultural approach to school as an institution. In other words, in the foreground are the students' everyday culture and learning, especially relating to the arts and mass media; schooling as an institution is in the background.

This positioning highlights questions about learning in relation to everyday communication practices and youth culture outside of school, such as participation in online games or other online communities. The rise of visual modes of communication can affect how young people use the Internet, including social software or Web 2.0 tools such as Facebook and YouTube. I focus on particular young people from my study and how they design with the different language modes in light of the visual, iconic turn. I explore whether these 18-year-olds, representative of their generation, are experienced, active designers of multimodal texts and question whether they have previous experience with filmmaking. I examine how they bring their experience into school in the framework of this one-week animation workshop.

The idea of a generation as homogeneous, especially the so-called "digital generation" (Buckingham & Willett, 2006) or "millennials" (Pedró, 2006), is worth questioning. Many researchers discuss not only the notion of a generation (Buckingham & Willett, 2006) but also question that a whole generation can have special abilities, such as abilities with using various forms of mass media. The generation born in the 1980s is the first to grow up surrounded by visual, digital media. But while it is well documented that this young digital generation in the Western world consumes large quantities of digital mass media, it is also

clear that the generation is heterogeneous in their abilities with digital media (European perspective discussed in Pedró, 2006).

In my case study, I examine how five selected students, through their attempts at designing and critiquing films, reflect on themselves and our shared cultural narratives. The students' animated films are examples of "shared cultural narratives," to use American cultural psychologist Jerome Bruner's phrase (1994). I attempt to position everyday culture in relation to the themes in the students' animated films and to the process of composing those themes. Furthermore, I relate the students' everyday culture to their past experiences with designing art and media, and connect their personal understanding of art, culture, and history to their design of animated films in the classroom.

Technology is the last issue that I introduce here that relates to the main topic of learning. Technology impacts our communication resources: for example, the telephone allows us to talk to someone who is far away. New technologies allow us to use our communication modes in new and different ways. In my view, technologies are not neutral; rather, they affect how people use resources for communication. Seen across history, social and technological changes impact our use of modes and our various texts, including our mass media.

I explore the idea of invention briefly in the example of films and filmmaking. Consider that in 1895 films were silent, but in the late 1920s, "talkies" became technologically and economically viable. In a similar vein, the digital technologies for producing animation are changing rapidly, especially with the advent of three-dimensional (3D) computer-generated imagery (CGI). Animation is increasingly used in mass media representations; it allows for the visualization of alternative spaces, including special effects and fantasy worlds—such as in the popular animated full-length film series *Shrek* (by DreamWorks Animation), made entirely with CGI. Our technologies offer more and different resources for designing in different modes of representation. Filmmaking is changing due to new digital technologies, and this change impacts who is making films, an idea that is debated widely in media and education research (for example, Loveless, 2007). Today, even amateurs, such as the students in this study, may have animation software and sophisticated cameras. Filmmaking equipment is now affordable and accessible for amateurs, and films can be distributed on the Internet. The rise of visual modes in our mass media is partially due to the rise of digital formats that can handle moving visual images and sound, both of which require great capacity for storage and transportation. Technical advances such as improved Internet bandwidth now make it possible to produce and send images and sound relatively easily.

Ultimately, I view technology and social changes as being dynamically connected throughout history, from the invention of the wheel to the many advances of today; this idea is

shared by many media researchers (such as Manovich, 2001). I do not see technologies as a driving force; instead, my perspective relies on the double process of how texts and agents transform through communicative practices (including interacting with one another). Digital technologies are not a primary optic, but I do consider how technologies impact resources for representation, exemplified in the students' use of animation software, analyzed in Chapter 8.

1.2.2. The formulation of the research question.

Given the broad shifts in learning and culture in relation to young people, mass media, and technology, I will now narrow in on my focus for this study.

The research problem is an exploration of two aspects of filmmaking in regards to learning: designing and reflecting. Designing is explored by studying the students' concrete actions of designing films. These actions are observable. Reflecting is explored by applying a model for understanding the internal thinking of the students as filmmakers. This thinking hypothetically occurs while the filmmakers are making films, as well as afterward, when they reflect back on the experience and integrate it. The notion of experience is applied to the students' previous experience, especially regarding designing and interpreting complex multimodal texts such as films.

The research problem refers to learning as the representation of meaning and aligns with the social and cultural orientation toward learning issues in some of the literature on social semiotics (for example, Kress, 2003).

1.3. The Central Hypothesis, the Research Question, and the Model Animating Symbols

In this section, I review the research question and the main hypothesis. Next, I introduce the model Animating Symbols, which illuminates the dynamic, two-way process of designing and reflecting, and clarify my ideas of designing and reflecting. I present the model now in order to logically lead up to the theoretical discussions about literacy and competence in Chapter 2.

1.3.1. The main research question.

The main research question refers to a dynamic double process between inner thinking (such as learning and reflecting) and the outer representation (such as a multimodal text). In this double process, designing and reflecting are viewed as interacting continually in a

transformative learning process. Both processes are necessary and have equal importance; the concrete designing and abstract reflecting are not intended as hierarchies of processes. Rather, the hands-on, concrete design experience is central to developing the more abstract form of thinking in an ongoing interaction (Dewey, 1938). The dynamic energy of designing drives a process of reflection.

The main research question is: How are the students designing and reflecting in relation to their transformation of texts, with particular attention on animated film texts? My research question is a rather open, *how* type of question. I am seeking first of all to attain a description of the interactive processes of text design and reflection. In order to explore this interactive process, I ask *how* processes of designing hands-on multimodal texts relate to processes of reflecting, and *what* relates together in the double process of learning as transformation. The question of *how* is also directed at how to analyze my data. It leads to the generation of hypotheses and findings. My hypothesis is that reflection develops through the hands-on experience of designing, and that repeated opportunities for critical reflection of one's own (and other people's) texts are significant. The discussion revolves around the central hypothesis: designing a text needs to be qualified as a process of learning. Learning develops over time and therefore, it is imperative to offer repeated opportunities for concrete experience and reflection of that experience in the abstract (discussed in regards to reflection models in Chapter 4, based on Dewey, 1934). My argument is that the design experience may connect dynamically with reflection as a process of thinking, such as thinking about signs, narratives, and even one's own values in relation to cultural identity. These hold the potential for learning (Sørensen, Buhl, and Meyer, 2006). However, the design experience may not connect for various reasons, a problem I call "hindrances" to learning (based on Dewey 1934, 1938). I use the word *findings* cautiously; I prefer to see findings as steps leading to more questions that introduce dialogues with peers and data, rather than absolutes or truths.

The double process of designing and reflecting is complex, and it is helpful to break down the double process into operational components. The three components of data analysis are filmmakers, filmmaking, and films. Methodologically, I apply MDA (see 1.5). The three aspects are separated for analytic purposes but are seen as united and coexisting. I mine the collected data for examples of this double process of learning, which includes designing and reflecting. The chosen determining data components reveal examples of the dynamic of designing texts and reflection. I qualify my choices of data examples by scrutinizing the choices and discussing what warrants my claims about learning.

I intend to study how actively *designing* texts connects with *reflecting*. Therefore, I constructed a case study to evaluate how young people learn about mass media by making

their own texts; through the study, I also capture examples of their underlying past experience and their thinking by examining their discourse about visual arts and mass media texts. The week-long animation workshop in the case study is conceived as one step in the students' ongoing development of multimodal design competence (presented in Chapter 12).

1.3.2. Presentation of the model Animating Symbols.

Here I introduce my model Animating Symbols to facilitate understanding of my main argument. It is discussed at length in Chapter 4. The model is applied to the data analysis in Section II. In Section III, I use the model to discuss how designing multimodal texts, such as film, media, and art, can relate to developing reflection.

I propose this model as a way to understand the transformation of inner and outer sign- and symbol-making, an active process I term "animating symbols." My model on reflection refers to learning as a pragmatic, experiential, and transformative process. Dewey and other pragmatists describe a work of art as the connecting link between the artist and reader, viewer, or audience and view reflection as a cumulative experience. This transformative process is seen as relevant for developing cognition and communication skills. When we communicate, we exchange ideas (or what might be called thoughts, feelings) through a complex process of using representational systems in our attempt to express our ideas and understand the ideas of others—and otherness in general (Dewey, 1934, 1938). This process refers to a "dialogic" process of communication, which in turn refers to a continual, iterative process of interpretation and learning to see others (and texts) from multiple perspectives.

The term *dialogic* pays homage to literary and art theory (Bakhtin, 1981; Eliot, 1922). All authorships are dialogic, which implies continual dialogue within texts, between people, and with previous works and authors. The term *dialogic* as I use it refers mainly to human-human and human-text interaction and appears in classroom discourses that are part of a "learning dialogue" (Wegerif, 2007). I use the dialogic notion as it relates to philosopher, literary critic, and semiotician Russian Mikhail Bakhtin (1895–1975), who inspired many later social semiotic and educational theorists (Kress, 1997). My model also pays homage to ideas of reflection within cognitive and cultural psychology, conveyed by thinkers such as Bruner (1990, 1991, 1997). The distinctions among theorists are discussed in Chapters 2, 3, and 4.

British media, art, and design educators and researchers are inspirations for my model. A direct source for my model (Figure 1.1) is the diagram "Interaction of internal images and

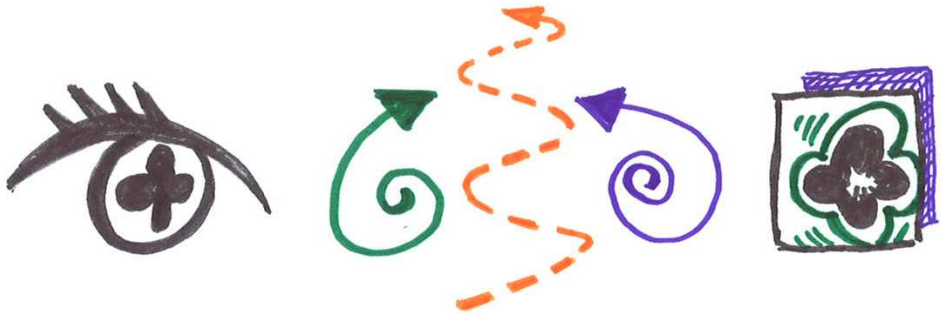
expressions in drawings" (Kimbell et al., 1996, p. 24), which appears in a research-based book on the school subject "Design and Technology," taught in the United Kingdom in the 1990s. Another source is the overview by English media educators Andrew Burn and James Durran (2007, p. 8) that I discuss in the literature review. Burn and Durran describe the dialogic process in relation to students' media texts and people in general; they discuss the processes "through which we understand the media texts we encounter," including such practices of interpretation as face-to-face talking or formal analysis, as well as designing texts, or "our own production of texts" (pp. 19–20). I attempt to pull these sources together in my model of the process of meaning-making, which involves continuous double processes of transformation: on the level of the inner sign-making of agents, and the outer sign-making of texts.

The internal processes are represented in Figure 1.1 as an eye (representing the "mind's eye") and a green spiral, to show the thinking process. This internal process potentially integrates concrete experiences with abstract thinking (Dewey, 1938). This thinking relates to prior interactions with other people, cultural signs, and symbols. A multimodal text production process, such as the animated film production, can thereby be seen to bring about epistemological changes in the "thinking" of the filmmaker, or in the viewer.

The external processes are represented in Figure 1.1 as a square frame and a purple spiral to show a transforming, or evolving, text composition process. Kimbell (1996) discusses that concrete external expressions allow for an examination of the reality and clarity of an idea. Between the internal and external processes, dialogue occurs—not just in the everyday sense of exchange, but as a dialogic "interanimation" of perspectives, a process that does not necessarily lead to synthesis (see Wegerif, 2008). A dialogic learning process refers to the ability to hold multiple interpretations and standpoints for reflection. This dialogic, reflective process is illustrated as a dotted orange line in the center of Figure 1.1.

Figure 1.1

Animating Symbols



This is a model of the inner and outer processes of reflection as a transformation in a double sense. To the left are a "mind's eye" and a green spiral, illustrating the transformation of the internal thinking process. To the right is a purple spiral, illustrating the transformation of a text. In the center is a dotted orange line, modeling the continual dialogic reflection process in relation to the transformations in the thinking process and the text.

The design process of filmmaking involves a filmmaker (or any author of any type of text) shifting between internal thinking and external acting. The author shifts between internal concepts as they become externalized as symbolic expressions, and external representations as they lead to the internal processing of concepts in the "mind's eye."

1.3.3. What is designing?

The term *designing* is used in the model above and relates specifically to composing texts comprising moving images and sound, especially animated films. My use of the verb *designing* refers to what may also be called *making*, *producing*, *creating*, or *articulating*. I adapt *design* as a theoretical term from Kress and his books *Before Writing* (1997) and *Literacy in the New Media Age* (2003), as well as Kress and van Leeuwen's *Multimodal Discourse* (2001) and *Reading Images* (2006). Design is active and distinguished from what may be called *critique*, such as doing a critical analysis of a text (see Kress, 2003, pp. 162–163); although design does involve interpretation and critique.

Designing as a notion relates to resemiotization (Iedema, 2001, 2003), which refers to a dynamic view of both social processes occurring with texts and the connections between texts, or the "inter-textuality" of signs and symbols. Such terms highlight how designing a new text involves incorporating previous uses of signs and symbols. A new text is unique, but it references multiple sources and meanings.

I use *designing* as a verb—an action that is observable—while the term *design of films* refers to the composition of finished films. My particular interest is how designers (the students in my case study) confront obstacles, such as when their texts do not represent what they want them to represent, and how they try to resolve design problems in relationship to one another. Social semiotic theories of design are discussed in Chapter 3.

1.3.4. What is reflecting?

Reflecting is commonly called "interpreting" or "meta-thinking" (Rattleff, 2006) about one's own way of grasping meanings. Kress (1997) views reflection as being bound up with interpreting or reading and discusses the processes of cognition, in which reading is not simply the process of assimilating meaning but a transformative action that involves "abstraction and condensation" (p. 58). From this viewpoint, any reader, author, or multimodal designer is thus actively transforming so-called internal signs, to varying degrees and in various ways.

An example from my data shows how the students in the film group *Metamorphosis* re-edit their film's soundtrack after receiving negative responses from viewers. Confronted with alternative readings (interpretations) of their film, they must reflect on how and what their text signifies to others and assimilate the meanings that others assign to the text; in turn, this leads then to re-edit the soundtrack. I discuss theories and models of reflection and agency in Chapter 4.

1.4. The Theoretical Concepts Used to Study Learning

To recap, I apply a social and cultural perspective on learning based on social semiotics and its synthesis of theories. I am especially interested in the roots relating to pragmatism and visual semiotics (Kress, 2003; Kress & van Leeuwen, 2001, 2006; van Leeuwen, 1996, 2001, 2005). The pragmatic learning theories offer a useful understanding of how people bring their past experiences to the present and how they "design" narratives in an ongoing interaction with others. I draw from theoretical and methodological perspectives that do not see individual agents as "alone" but as culturally bound with one another (Bruner, 1990, 1991, 1997; Dewey, 1934, 1938; R. Scollon & S.W. Scollon, 2004).

I refer to the students as both designers and filmmakers. I use the terms *designer* and *filmmaker* in a theoretical sense and view the students as agents, sign-makers, and symbol-makers, or authors of a new language, as inspired by Kress (1997). I use the term *filmmaker*

more specifically to refer to filmmaking as designing with moving images and sound. Otherwise, I use the terms *designers* and *filmmakers* interchangeably. When relevant, I refer to specific roles within the film groups, such as film instructor.

The learning process is an interaction between texts and agents who are culturally bound to one another; they share and design narratives by interacting with one another. I include individual portraits at the beginning of the data presentation out of a concern with individuals' cognition and cultural identity. These portraits are attempts to gain insight into the individual experience; I am interested in the individual person, though I see the individual as embedded in the social field (Kress, 2003). Below, I discuss the central concept of double transformation and exemplify how I apply it analytically.

1.4.1. Transformation as a double process.

Hands-on experience with designing multiple modes of discourse is fundamental for transforming "thinking" in an ongoing developmental process, as per my Animating Symbols model. Interactions with others can develop an individual's reflective process about the text, thereby transforming thinking processes. Tangible examples of transformation include how ideas take concrete forms and involve making choices.

Authoring a text involves an ongoing transformation of texts. Ideas transform when shifting or "transducing" (Kress & van Leeuwen, 2001) referring to how meanings may change across modes and alternative meanings. For example, the film group *Metamorphosis* changes the representation of their figure Apollo and his "love" for the figure Daphne at the end of the film from what they planned on their storyboard. This appears to be related to the process of transducing (transforming across modes) ideas from stills on their storyboard to moving images, as well as various group discussions about how to represent meanings. The text thereby transforms while in process as the filmmakers attempt to find the right—or, as social semiotics would say, "apt"—representation (Ibid.). The apt representation involves selecting the apt forms, modes, and meanings for the multimodal ensemble (referring to the combination of modes, such as audio/visual). The filmmakers transform the film text, but, more importantly, they may also transform their thinking about how signs and symbols communicate meaning.

1.4.2. Introducing literacy or competence.

In the data analysis, I draw out and discuss examples relating to the development of multimodal "design," which I suggest can be called "multimodal design competence." The ideas of literacy and competence are needed to account for questions of learning. The litera-

ture review in 1.6 provides more background on the underlying problems with terms. Following is a sample from my data that shows a superficial problem with the terms *literacy* and *competence*.

An example of design as reinventing language is from how students making the animated film *Out-breakers* want to communicate the idea of escape from school. They consider representing escape through the film figures' motions, style and how sound can represent escape in their film. They ultimately use surreal figures (pencils with eyes), a rapid tempo with downward movement, and combine this with a humorous use of songs, including the song "Staying Alive" from the movie *Saturday Night Fever* as a comment on surviving escape. My point is that they play with a multiplicity of meanings in the design process and make semiotic choices in a process of creating a unique ensemble of meanings. My argument follows social semiotics: that learning through designing involves being able to "invent" new meanings. But the example above indicates that this kind of creativity and invention may risk becoming overlooked as a competence in upper secondary school, especially with reference to the focus on college preparation in the Danish *gymnasie* line.

Let me switch briefly to literacy, which is a much-debated topic theoretically (Buckingham, 2003, 2006; Burn & Durran, 2007; Gee, 1996). It is a disputed term in English-speaking countries, partially because it is so attached to the term *literature*. The term *literacy* is more complicated in Scandinavia, since the word *literacy* does not exist in our languages. (But *illiteracy* translates to the Danish *analfabetisme*.) However, literacy appears in the current debate around Scandinavian education due to influence from literacy theories and practices in Anglo traditions; for example, it is used in relation to studies of media productions by young people in Norway (Erstad et al., 2007; Erstad & Gilje, 2008). So while terms have diverging interpretations and traditions, they may be converging (see 3.2.4).

1.5. Overview of the Methods for Addressing the Main Topics

The three components of data analysis are filmmakers' experience, filmmaking interactions, and films as texts. A review of the components is followed by an introduction on methodology.

The *filmmakers* component encompasses students' experiences and background, including mass media and the arts. Five individual students are highlighted as examples and presented as portraits. I explore how they interact as filmmakers in the present, such as when they design work in two of the film groups at the school. My focus is on the students, but I give some attention to the teaching perspective and school culture. The portraits of indi-

viduals, the roles in the group, and the students' interactions are in the data analysis in Chapter 7.

The *filmmaking* component refers to the actual designing of films that occurs in two film groups participating in a week-long animation filmmaking workshop in a Danish upper secondary school. The teachers are relevant, but I demonstrate mainly the *student-student* interactions of designing within the film groups, with a focus on two particular groups of students. I study how the students communicate in a variety of modes: their words in conversation, written words, their gestures, and images. The data capture the process of designing the films, including how students transduce (or transform) ideas across semiotic modes, such as from storyboard to sound editing. See the data analysis in Chapters 7 and 8.

The *films* component refers to the films that result from the week-long animation filmmaking workshop. The films have high priority as data that indicate representation, as they are "texts." The films are examples of design as the remaking and invention of language. The films undergo a social semiotic analysis of their composition, including an iconographic analysis of thematic content. See the data analysis of films in Chapter 9.

1.5.1. Introducing the methodology.

My methodology is presented in Chapter 5 and the methods in Chapter 6. I have combined ways of dealing with the social action of designing multimodal texts, following a social semiotic view of how social actions shape the text (Kress, 2003). In order to analyze the social actions or interactions between text and agent, I required methodological instruments to capture the students' patterns of interaction. I chose a discourse analytic approach based on critical discourse analysis (CDA, Fairclough, 1995, 2005)—specifically, the methodological framework of MDA (Scollon & Scollon, 2004), which pertains to intersections of discourses that are analyzed with a microsociological approach. Studying the micro-details of social interaction is useful in gaining a view of the larger phenomenon. MDA offers strategies for multimodal interaction analysis that consider the agents' experience, their multiple modes of communication, and their technologically mediated interaction. This is relevant for exploring the different facets of my research question.

MDA combines theories of social linguistics, sociocultural learning, and pragmatism (as based in phenomenology). It pays homage to the influential Canadian American sociologist Erving Goffman, especially his *Forms of Talk* (1981), in which he explores how talk or conversation can be viewed with a microsociological approach to the whole of physical, social, and cultural contexts. Goffman (1981) developed a theoretical framework for "roles"—not in the sense of making a large "literary claim that social life is but a stage" (p. 4), but in the

sense that humans are deeply involved in social frameworks. I refer to roles within a film team, such as "instructor," and discuss roles of "expertise" and the notion of being a winner or loser in school. (I review my "role" as a researcher with a video camera, which shapes my own participation and may influence others in the classroom, in Chapter 5.)

The research question relates to three interrelating data components: the filmmakers' individual experiences, the filmmaking as a series of interactions (especially student-student interactions in the film groups), and the films as texts. My methodological "tool box" integrates related discourse analytic approaches (sharing inspiration from Fairclough) of social semiotics and MDA. The data components are related to the three basic aspects of MDA, which I term *discourse in action*, *interaction orde*r, and *experience*. See Figure 5.1, which I have reworked from the diagram "Nexus Analysis" (Scollon & Scollon, 2004). I utilize the three aspects of MDA with the intention of bringing the data components together and answering the research question. MDA is applied largely to analyzing the "experience" of the filmmakers, and to the "interaction order" of designing their film during the animation filmmaking workshop. But MDA does not offer an in-depth method for film analysis with the "discourses in place" aspect. The film data call for an expanded analytic treatment of a multimodal film text using a social semiotic and related iconographic approach, as detailed in Chapters 5 and 6.

1.6. Review of Relevant Fields of Study and Practice

In the following section, I review studies that are relevant to my research and raise issues for discussion around cultural, creative, and critical learning approaches as well as my chosen social semiotics approach. I attempt to raise various problematic issues that occur in previous studies. In order to frame and position my work, I have looked to work done in a similar vein. A model from *Media Literacy in Schools* (Burn & Durran, 2007, p. 8) aims to accommodate diverse research approaches. It serves my purpose here as a framework for my literature review of young people's filmmaking, combining social semiotics and cultural studies. Also, it provides interesting topics for further discussion in relation to my attempt at adapting their model for my use (see Table 2.1) in upcoming chapters.

Table 1.1

Reproduction of "Media Literacy: A Cultural-Semiotic Model", from Burn and Durran (2007)

Cultural contexts	Social functions	Semiotic processes
Lived	**Cultural**	Discourse
Selective	**Creative**	Design/Production
Recorded	**Critical**	Distribution
		Interpretation

The cultural contexts in Table 1.1 refer to arguments for a cultural studies approach that must be integrated with media education studies, especially the contribution of English researchers David Buckingham and Julian Sefton-Green, *Making Media: Practical Production in Media Education* (Buckingham, Grahame, and Sefton-Green, 1995), as well as later work (for example, Buckingham, 2003, 2006, 2007; Sefton-Green, 1998, 2000, 2005). The lived, selective, and recorded terms reused by Burn and Durran (2007) refer to the work of cultural theorist Raymond Williams. I draw on similar ideas from British cultural theorist Paul Willis and Danish media researcher Kirsten Drotner.

The social functions of the above model are termed a central "trunk" (Burn & Durran, 2007) that align with the various emerging research approaches related to media literacy. The "semiotic processes" on the right refer to social semiotics. Below, I explore these areas around the "trunk" of what they call the 3 Cs: cultural, creative, and critical learning approaches within art and media pedagogy. I conclude the review with research that combines the 3 Cs to some degree with social semiotics. The semiotic processes above refer to my main theoretical approach of social semiotics, and the notion of four strata (a term from Hallidayan functional linguistics): discourse, design, production, and distribution (Kress & van Leeuwen, 2001). I present this at length in Chapter 2 (see Table 2.1).

My goal for this review of relevant studies is to launch a dialogue with previous studies. The literature review spotlights studies of young people as designers of multimodal texts, especially filmmaking and animation, and issues of designing and reflecting. To limit the scope, I review mainly case studies from English-speaking countries and Scandinavia. In my critique of previous studies, the 3 Cs are applied for the sake of discussion, but this is not an attempt to inflict categories or pigeonhole other studies.

1.6.1. Approaches to the *cultural*.

The cultural approach refers to the field of cultural studies, which is concerned with contexts that are mainly outside of school and maintains a cultural perspective on youth, digitization of mass media, and media production. Three themes in the cultural approach are discussed below: identity, fandom (fan culture), and digital storytelling. The problematic issues in a mainly cultural approach are that the selected agents, such as fans, may not be representative of young people in general, and that the definitions of identity and learning theory appear unclear. The cultural approach is weak in terms of generating insight into learning, but it also provides valuable concepts, such as a youth-oriented view on the arts as embedded in everyday culture (Willis, 1990, 2000).

Notions of identity development and learning processes regarding designing and interpreting media are vague—a general problem in cultural studies. For instance, Drotner stresses the cultural impact of mass media on texts, such as in her study of film production by young people at a Danish *efterskole* (alternative school year; 9th or 10th grade) (Drotner, 1999), and examines how young people's identity interplays with mass media such as Disney films (Drotner, 2004). More recent work includes Drotner and Nyboe's case study of animation with Danish school students (12–13 and 15–16 years old), where they relate cultural identity to "communicative and communal properties of creativity" (Nyboe & Drotner, 2008, p. 162). Drotner (2008) argues elsewhere that identity and culture relate to digitization, which is the process of creating practices that "operate as key drivers of future competence formation" (p. 61). She points to the problem of "untangling" learning and suggests a combination of multimodal learning theory (Ibid.) and the direction of British media literacy taken by Buckingham and others. But the ideas of creativity and competence call for a more critical consideration of rhetoric (discussed in Banaji & Burn, 2007).

A recent study contributes to understanding young people's culture, in particular their online global culture. The Digital Youth projects consist of 21 different ethnographic studies led by Japanese American media researcher Mimo Ito (Ito et al., 2008) that look at identity, communication, and out-of-school Internet activities. Ito also led one of the case studies on re-edited Japanese animation as examples of "anime fandom" in amateur cultural production (Ito et al., 2008). The 21 authors in the Digital Youth projects divide young people's Internet usage into two categories: fan-driven and social. They point out that the overall findings are that today's young people struggle for "autonomy and identity" (Ibid.), but their arguments about how this is differs from previous generations could be stronger. The benefit of consolidating 21 studies is the resulting view of the patterns of fans versus social uses of the Internet.

There is little academic research in digital storytelling, but two research programs focus on the topic. One is a program at Oslo University (Lundby, 2008). Another program includes Glynda Hull and Mark Evan Nelson at UC Berkeley who refer to their own experiences with instructing young people in digital storytelling workshops and investigate storytelling academically. Hull and Nelson's analytic work on the symbolic systems in multimodal texts leads to discussions about learning, semiotics, and identity formation and how technologies shape the lives of young people (Hull, 2003, 2006; Hull & Nelson, 2005; Nelson, 2006) and refers to dialogic and reflective elements (Hull & Nelson, 2008). The contributions by Hull and Nelson are valuable to the development of social semiotics and have inspired me directly. However, when they attempt to demonstrate the relationship of filmmaking to identity, they encounter a problem with complexity. When reflecting on their approach, I find we share issues of complexity, particularly in combining theories and methodologies to connect filmmaking by young people to cultural and educational theorists, as well as in aiming to impact practice in various learning contexts.

Note that the term *digital storytelling* refers to both the broader notion used in academia (short digital narratives by amateurs) and the instructional method (The Center for Digital Storytelling, 2007) that emphasizes cultural, personal, and digital stories.

1.6.2. Approaches to the *creative.*

Approaches to creativity grapple with problems of aesthetics, including how the quality of the end result can be evaluated. Visual youth culture researchers refer to creativity as interrelating with media "tools" and to subcultures of arts activities outside of schools or organized institutions (Gauntlett, 2007; Willis, 1990, 2000), such as the cultural contexts as "lived" in Burn and Durran's model. Willis (1990) does not study film directly; in fact, he critiques research on the arts that starts from "the wrong end of the social process" (p. 5)—that is, research that starts from objects and artifacts rather than from people. Willis raises questions on whether an aesthetic effect can be and should be seen in the text (as in a finished artwork or film) or whether the effect is within humans: "Part of the sensuous/emotive/cognitive creativities of human receivers…These creativities are not dependent on texts, but might be enabled by them" (p. 24). English media researcher David Gauntlett (2007) studies creative processes, including how people present themselves visually and metaphorically such as by using LEGO bricks. Gauntlett and Willis's studies are inspirational, but they lack transparent operational methods and methodology in regards to their claims about young people as being creative.

Creativity is highly complex and refers to multiple approaches. A previous review of creativity as it relates to literacy, arts, and media education (Banaji & Burn, 2007) tries to sepa-

rate the many terms and types of rhetoric. Media educators Shakuntala Banaji and Burn conclude that certain types of rhetoric regarding creativity may be more "useful" than others; the implications of a "culturalist" approach that integrates a social and psychological approach might be useful for analyzing the media literacy of children and young people. They argue for a cultural psychology, harking back to Vygotsky's understanding of the shifting between inner, intellectual activity and outward, fantasy play, or design activity. Thinkers such as Bruner are also discussed by Banaji and Burn as helping to clarify the culture of education. This review offers a valuable critique of the gaps in the cultural field in relation to learning and education.

Another area in the literature considers digital design tools, especially the impact of editing software, which has been available since around 1990 (Manovich, 2001), and how it influences remix (or resemiotization). Empirical research on young people from a software perspective is sparse. Sefton-Green (2005) studies the use of filters, such as how Photoshop and Final Cut Express offer a "library" of options to modify still images, sounds, or film clips. Norwegians Ola Erstad, Thomas de Lange, and Øystein Gilje discuss remixing by analyzing young student filmmakers and propose that developing competence includes altering semiotic material through a design process with digital tools (Erstad et al., 2007; Erstad & Gilje, 2007; Gilje, 2008). Gilje (2008) refer to interactional analysis and sociocultural theories of learning with "cultural tools" (Wertsch, 1991, 1998), inspired by Vygotsky. Danish film and media researcher Heidi Philipsen (2005) uses sociocultural theory in her case study as well, but her analytic focus is on how instructional scaffolding with limitations, or "dogme rules," affects the creative processes of filmmaking at the Danish National Film School. The sociocultural and pragmatic orientation of the aforementioned studies attempts to convey a process-based account of learning filmmaking as a creative process, thus addressing what I consider "gaps" in the cultural approach.

I mention briefly the wider literature on art education. Although it contains few references to filmmaking, I use it to problematize art traditions in schooling. Art education has a classic instrumental approach, with a focus on materials and crafting (Davies, 1997; Neperud, 1995; Lowenfeld & Lambert Brittain, 1975)—for example, the practice of teaching art by using a specific material, such as linoleum printmaking or watercolor. Critical voices include the contemporary Danish art educator and researcher Helene Illeris (2002, 2006, 2008), who studies art that involves social interaction and engagement with an audience and discusses teaching in light of conceptual, contemporary art. Art pedagogy and practice are relevant for understanding the different, "clashing" practices between the teachers in my classroom study.

The difficulty in evaluating creativity in schools, especially in art- and film-related subjects, is discussed elsewhere (Loveless, 2003, 2007; Sefton-Green, 2000; Sinker, 2000). Broader creativity research raises the issue of social context (Amabile et al., 1999; Eisler & Montuori, 1995; Csikszentmihalyi, 1996; Janssen & Rijlaarsdam, 2006; Paulus & Nijstad, 2003). However, devising models for the evaluation of artistic, multimedia work of young people in school is widely known to be a problematic area (see Facer, 2002; Loveless, 2007; Sinker, 2000). Problems of context, tools, pedagogy, and evaluation underlie my study. I do discuss teachers' perspective and pedagogy in Chapters 9 and 12, but I prioritize the account of processes and the cultural perspectives over instructional problems.

1.6.3. Approaches to the *critical.*

Researchers who have addressed issues regarding criticism of media include Danish educational researcher Birgitte Holm Sørensen and other Scandinavian art and media researchers who have studied designing films (Sørensen, 1999; Sørensen & Almqvist, 2000; Sørensen, Buhl, and Meyer, 2006; Tufte, 1998). A number of studies of young people designing multimedia texts from the last 10 years stem from Knowledge Lab (affiliated with the University of London) under the leadership of Buckingham (Buckingham, 2003, 2006, 2007; Buckingham & Bragg, 2003; Buckingham et al., 2003; Buckingham & Willett, 2006, 2007; Sefton-Green, 1998). Buckingham (2003) suggests that a classroom-oriented media pedagogy has three "vernacular discourses": inclusion, empowerment, and multidisciplinarity, where digital production practices are more or less "empowering." Some of the aforementioned studies focus on media and education or on everyday use, such as how amateurs use video camcorders at home (Buckingham & Willett, 2009). Buckingham (2003) highlights two problematic issues: how to conduct research that connects young people's media usage and production inside and outside school, and how to address the wide differences among individuals.

The risk of exclusion becomes problematic in heterogeneous use or "digital divides." Much research into gender and technology aims to identify factors of exclusion (Oudshoorn et al., 2004; AAUW, 2000). Girls indicate less interest in technically oriented play, which relates to their interest and aptitude for designing with high-level technologies, which are involved in filmmaking (Drotner, 2001; Tufte & Christensen, 2002). United States-based educator Brigid Barron (2004) finds that this divide is really about "computational prowess," including design ability. A pattern of gender-based preferences in technology-based design is evident across the United States and Europe (Cassell, 1998; Kimbell et al., 1996; Rommes et al., 2004; AAUW, 2000). Sociologist Sherry Turkle (1988) describes this phenomenon among girls as "computational reticence," and United Kingdom researcher Teresa Keogh and her

colleagues confirm this (Keogh et al., 2000). The design of educational technologies is considered one way to overcome gender differences (Rommes, 2000; Stankiewicz, 2004). Other studies scrutinize how well young people actually use digital "tools" for their own productions (Livingstone, 2002, 2008). The critical approach is generally oriented toward collating research and influencing policy. However, issues for further discussion include how to generate useful information from broad surveys and correlate the many small-scale qualitative empirical studies to understand social phenomena.

1.6.4. Social semiotics approach.

The approach of addressing young people's film production with multimodal theory is relatively new. My study is mainly inspired by the combination of cultural studies and social semiotics as they apply to empirically based studies of animation filmmaking (Burn & Parker, 2001, 2003). See also evaluations of learning with digital video and animation in schools (Jensen et al., 2004; Reid & Burn, 2002). Recent Scandinavian contributions study film production with multimodal theory and discuss the agents' view and the context to some degree; that is, they integrate the text analysis and the users' accounts of their texts and discuss their findings in terms of school or other contexts (Erstad, 2003; Erstad et al., 2007; Lindstrand, 2006a, 2006b; Öhman-Gullberg, 2006, 2008; Frølunde et al., 2009). Perspectives from the aforementioned Scandinavian studies include questions on how media production experiences impact learning and identity. Swedish art educator Lisa Öhman-Gullberg's PhD thesis highlights gender aspects of representation, providing an in-depth social semiotic analysis of the films of two teenage girls (2008). Swedish film and educational researcher Fredrik Lindstrand has produced a fine-grained analysis of films by young people and also analyzes filmmaking processes (2006a, 2006b).

I have collaborated with Gilje, Lindstrand, and Öhman-Gullberg (2008–2009) in the research project *Making a Filmmaker*, funded by the Norwegian Media Council. This study addresses patterns of where, how, and why young Scandinavian filmmakers (15–20 years old) develop interest in film. We discuss methodology and methods of web survey and written online interviews (Frølunde et al., 2009), propose a map of how the learning contexts cross (Gilje et al., in press), and elaborate on the films (Lindstrand et al., in press). Other Scandinavian research on young people and moving images addresses the crossing of learning contexts: in school (Danielsson, 1998; Erstad et al., 2007; Erstad & Gilje, 2008; Öhman-Gullberg, 2008) and informal contexts (Drotner, 1991; Lindstrand, 2006). Danish media researcher Nikolaj F. Elf studies animation and other films by upper secondary students. Elf (2008) grapples with a synthesis of sociocognitive theory, social semiotics, and pragmatism.

In summary, the aforementioned studies that use social semiotics—especially when leveraging other approaches as well—face the challenge of being ambitious theoretically, have data that cross learning contexts, and address a host of issues for practitioners. The literature points to gaps including the ongoing need to define and distinguish approaches and terms, such as *creativity*. I find that cultural studies have weaknesses in terms of defining *identity* and making the findings transparent in terms of methodology. The intention of a text's author is of primary concern in social semiotics, although social semiotic case studies focus primarily on the texts and the authors' semiotic processes (such as those that occur during production). Therefore, I attempt to utilize the inspiration of the cultural approach in the portraits of the filmmakers as authors, and I include the text production process and texts. Various researchers attempt to use social semiotics, such as in sociocultural learning theories and cultural studies. Using interdisciplinary approaches is challenging, but it is vital to the development of the field of social semiotics (van Leeuwen, 2005, p. 69).

Multimodality has also influenced art pedagogy, although arts educators have always been concerned with the various ways that humans express and represent meaning (Sinker, 2000; Smith-Shank, 1995). Multimodality is heralded as becoming a "ubiquitous theme" that is pervading production research and the interpretation of "intertextual or intermedial" (Lehtonen & Herkman, 2002, p. 112) narratives and altering how we think about the multitude of symbolic forms humans use to represent ideas. It may also affect how we think about the traditional division between school subjects, such as languages, arts, and media and hard sciences.

1.7. Description of My Journey and Conditions Leading to the Project and Topic

Here I summarize my journey toward this study's theoretical and methodological approach, from conceiving the project in 2004 to finishing the thesis in 2009. I introduce the conditions of the research in relation to the project's funding through the Danish Research Centre on Education and Advanced Media Materials (DREAM). I summarize how I developed the project, beginning with a focus on the design of educational learning materials and ending with designing film as a learning process with a focus on the students.

My journey covers different points of view regarding design. I return to basic questions: Should *design* be used as a verb or a noun? Is it most relevant to define design as the concrete action of designing, as the agent's experience, or as the text itself? How can I capture the dynamic interaction of designer and text? Along my journey, I tried epistemological

frameworks on interaction. I want to briefly describe which theories I found inspirational and why, including theories that are now absent from or in the background of the thesis.

1.7.1. Starting with the topics of designing educational technology and learning.

My topics, designing educational technology and learning, stem from the goal of developing learning resources that forms the backbone of the DREAM consortium's six PhD projects, supported by the Danish Research Council (2004–2008). My project was co-financed by DREAM and the Danish School of Education (Danmarks Pædagogiske Universitetsskole or DPU), while the other five PhD projects were housed at Roskilde University or the University of Southern Denmark. In the following section I explain how the beginning of my PhD project was framed by collaboration with DR Education (Danish Broadcasting Corporation). Then I outline how and why my thesis topic shifted.

My data collection was intended to be an opportunity for DR staff to participate in design activities at a school, thereby informing the content and design of learning materials for www.dr.dk/gymnasium. The methodological point of departure in 2004 was a design-based research project (DBRC, 2003, 2005), or a "design intervention" study, with DR. The research goals included: intervene in the classroom, describe a best practice for learning materials, and contribute to the design of learning resources for animation filmmaking. However, the plan of involving DR staff was reduced to a small scale. This was in part due to changes in DR, including staff turnover and cutbacks in their budget crisis (2004–2005). Due to my limited time, I could not do iterations of design of educational technology (animation learning materials) and therefore could not fully use design-based research as a methodology. Also, my research interest shifted toward an ethnographic approach.

My theoretical interests in 2004–2005 were twofold. First, I wanted to describe how bodies relate to the design of technology with reference to phenomenology (such as Merleau-Ponty) and science of technology studies. Second, I wanted to explore self-expression and cognition, referring to the grounded aesthetics of Dewey and psychological theories about play and creativity. My concern was the gender gap within information and communication technologies (ICT), and I hoped to explore assumptions about differing interests between males and females through a case study in an art class. Questions regarding *why* and *how* this gender gap could be uncovered and altered were of interest. I assumed that working with filmmaking, especially animation, might appeal to female students and increase their interest in using ICT. One of my aims was to explore whether integrating more ICT in the arts in schools might encourage female students' interest in ICT. My working title was

"Aesthetic Learning, Gender, and ICT;" later, I changed it to "Animation, Gender, and ICT," with various subtitles on designing learning materials.

The early idea of educational design was carried out in the data collection and led to publications. The data collection included design workshops with students on a DR website. This resulted in my ideas for the *AnimationsØen (The Animation Island*) made in collaboration with DR, the teacher from the school, and a freelance animation historian (Frølunde et al., 2007) (see www.dr.dk/gymnasium).

Two academic results are relevant here. One is the co-authorship of a book chapter, "Balancing Product Design and Theoretical Insights" (Ejersbo et al., 2008). The topic is how design-based research is, ideally, a process where phases of design, enactment, analysis, and redesign are repeated; the production of research papers is a dynamic aspect of such a process. The chapter presents general design, production, and adaptation issues from a methodological perspective. Also, I was the first author of a book review of American phenomenologist Don Ihde's *Bodies in Technology* (Frølunde & Moser, 2005), which is about the history of philosophical thought, especially the visual in technological inventions.

1.7.2. Changing the main topic to students' learning.

After collecting the data and starting the data analysis in 2006, my interest shifted to the students' hands-on processes of designing the films; I was fascinated by what the videotaped data showed. I spotted some communication processes that I did not catch during my classroom observations. Therefore, I wanted increasingly to focus my analysis on the students' filmmaking process, which I saw as a creative, playful, and collaborative process of learning. I decided to write a thesis oriented toward learning to design. However, this meant shifting from my prior interest—the design of educational learning materials—to the topic of learning.

My introduction to social semiotic theory occurred in 2004 at the Computers and Learning Conference in the United Kingdom, but I questioned how to make it work for analyzing data from the students' processes of designing. The need for an approach to video data analysis led me to a PhD course on MDA in 2006, taught by Ron Scollon and Suzie Wong Scollon with Pirkko Raudaskoski and other staff at Aalborg University. There I found a starting point for my analysis and valuable guidance on MDA.

1.7.3. My learning process.

I want to mention three issues relating to my learning process: my own background for this project, dialogue with peers, and my approach to data analysis and writing.

My own background in design, visual art, pedagogy, and psychotherapy has influenced my work with the PhD. I was educated as an artist, illustrator and, later, as an expressive arts therapist in the United States. I have led art groups at psychiatric treatment centers in Boston, run play therapy activities with refugee children, and supervised art therapists in Denmark. My design background includes designing books and computer programs for educational publishing in the United States and leading concept workshops at LEGO with the purpose of developing ideas for digital construction toys with groups of children and LEGO designers. For instance, I co-developed LEGO Studio, a set with software and a camera for stop-motion animation, which sparked my interest in how children make films.

Due to this background, I had a prior understanding of theory and terms. For example, I knew that *potential* refers to self-expression, based on the notions of "potential space" for play (Winnicott, 1971). But learning *potential* with media and ICT has been used in education (Sørensen, Buhl, and Meyer, 2006). Linguistics was not my disciplinary background, so I needed to become familiar with social semiotics as well as literacy debates. Influences from my art therapy background include an understanding of multimodality that draw on notions of synaesthesia (how the senses interact) and phenomenology in expressive art therapy (Knill et al., 1995). I am also familiar with various psychoanalytic approaches to art-making, such as Jungian. I also had previous experience with the "cultural probe" method for eliciting dialogue in interviews, thanks to my experience with running workshops with children at LEGO and my engagement with arts-oriented therapies, where paintings, drawings, and narratives are integral parts of the communication between participants (Cameron, 1996; Knill et al., 1995; Riley, 1999).

Beyond my own background, ongoing discussions about separate but related research projects at DREAM have been fruitful, especially a project relating to how young people may gain scenario competence (Hanghøj, 2009) when participating in debate games, as well as the research and development of mobile-based narrative *Ego-trap* with Anne Kahr-Højland at the Experimentarium science center. The collaboration in the *Making a Filmmaker* project (Frølunde et al., 2009) has been very important for my learning. Also, discussions with psychiatrist Hanne Stubbe Teglbjærg (2009) about her PhD research on art therapy with schizophrenic patients and Tine Basse Fisker on her PhD study (in press) on multimodal interaction between young children have been fruitful.

Finally, my learning process involved finding the most suitable approach to data analysis and writing. I had collected very interesting data, and it was a challenge to narrow down the data analysis. The process of data analysis involved experimenting with methods in an effort to listen to the data. I have had to kill many darlings. For example, in order to simplify the thesis, I had to cut down the cultural studies approach. Writing this thesis was

challenging in terms of crossing modes—for example, using words to describe the rich data of moving images and sound. I consider myself a visually oriented person, learning to use the linear form of academic writing. There are many tables, graphs, and models in the thesis because these help me attain an overview; I hope they will assist the reader in following my line of thinking.

1.8. Overview of the Structure of This Thesis

The thesis is organized in three sections: the theory, the methodology with data analysis, and the conclusion.

Section I presents relevant theories of learning and the representation of meaning in communication, especially regarding moving images. Chapter 2 focuses on learning, especially the aesthetic aspects. Chapter 3 presents social semiotic views of representation and design. Chapter 4 presents a synthesis of the applied theories and focuses on the topics of agency and reflection.

Section II contains the methodology and methods for collecting and analyzing data, followed by the data. Chapter 5 discusses the overall methodology and standard criteria for research. Chapter 6 describes the specific methods for data collection and analysis. Chapter 7 presents the portraits of the five filmmakers. Chapter 8, on filmmaking processes, explores interactions in the classroom by following selected moments of filmmaking as a semiotic process. Chapter 9 focuses on the films and analyzes the final results of the filmmaking process.

Section III reviews the study's central themes and discusses the implications of the findings. Chapter 10 critiques the study and discusses its limitations. Chapter 11 reviews the study's contribution to the field and presents ideas for further studies. Chapter 12 offers a recapitulation my findings and a profile of multimodal design competence around three aspects: cultural (as in understanding oneself in relation to culture and history), creative (referring to the active semiotic processes of designing ideas that transform to a film, including technical production), and reflection (referring to the aesthetic and the critical dimensions of interpretation). Chapter 13 considers the implications of the study that were not suitable for discussing in relation to the data, but which I find interesting for further debate.

The written thesis is supplemented by several materials. There is a full appendix on DVD for the committee, including the films and videotaped data. The video is for the committee only, for ethical reasons (the viewing guide is in Chapter 8). See the detailed list at the end of the thesis. Selected video stills are in the thesis.

Others can view the two animated films central to the data analysis on these Web sites (available until the end of 2010):

The film *Metamorphosis*: http://stream.dpu.dk/public/lif/metamorphosis.wmv

The film *Out-breakers*: http://stream.dpu.dk/public/lif/outbreakers.wmv

The films and learning materials are available at www.dr.dk/gymnasium, but full access is limited to subscribers.

1.8.1. Concerns about reporting: translating data.

In this section I review my concerns about translating and organizing data. I chose to work with two languages, Danish and English, with the data in Danish and the write-up in English. Doing so led to the loss of certain meanings in my Danish data and the acquisition of other, perhaps unintended meanings in English. Something is admittedly lost in translation. Most of the students' film titles are plays on words, and their use of irony is difficult to communicate in another language. I have chosen to present the thesis in English for two reasons. First, I assume that the subject is not local to Denmark but may have applicability and interest for a wider audience. Second, by writing in English, I provide a global context for the case study. Writing for a (possible) wider audience helped me understand the cultural context (or "Danishness") of the study differently—for example, whether the resemiotization by the students refers to Danish literary or arts sources, or to sources crossing many countries.

2. Theories of Learning

In Chapter 2, I explore the theoretical concepts of learning that concern the literacy and competence of design. I intend to position my use of learning theories in relation to each other and to establish my key concepts for empirical data analysis. In order to position the theories, I provide a dialogue with the theoretical concepts of literacy and competence and present my key terms (Table 2.1). The notion and theories of "new literacies" is reviewed briefly. My application of social semiotic theories is discussed here in terms of literacy and competence, as elaborated by Kress & van Leeuwen (2001, 2006) and the Kress (1997, 2003) and as applied by Burn and Durran (2007). I use these standpoints as a point of departure for discussing some of theories derived from social semiotic theories, including the sociocultural approach of American psychologist James Wertsch (following Vygotsky 1978, 1986) and CDA by the Englishman Norman Fairclough (1995, 2005).

I relate these discussions to a theoretical understanding of designing and reflecting and develop a set of specific abilities that are framed as multimodal design competence, which are examined by applying the social semiotic idea of strata and reflection as a double process of transformation. I point to the Deweyan pragmatist views in my attempt to understand experience from a perspective on the individual as an agent, rather than an environmental perspective. Note that internal thinking is central in Chapter 2, while Chapter 3 emphasizes external articulation. The theories I apply are synthesized and discussed with special attention to agency and reflection in Chapter 4.

2.1. Literacy and Competence: Contested Theoretical Concepts

This section introduces my key terms for discussing what I refer to as *multimodal design competence*, with reference to the Table 2.1. It refers to Burn and Durran's *Media Literacy in Schools* and their model (2007, p. 8), reproduced in Table 1.1. Table 2.1 draws from social semiotics and the four strata of semiotic processes (inspired by Halliday) of discourse, design, production, and distribution (Kress & van Leeuwen, 2001). Strata are seen as domains of practice that coexist as layers of a semiotic process but are not steps in a chronological process. British Australian linguist Michael A. K. Halliday developed strata within "systemic functional linguistics" (Halliday & Hasan, 1985), which laid the groundwork for social semiotics (see Chapter 3).

Table 2.1 is an attempt to distinguish the theoretical terms that underlie my approach.

Table 2.1

Key Terms for My Approach to Multimodal Design Competence

Social functions	**Semiotic processes**
Cultural	**Discourses**: historical cultural sources. Experience of agent.
Creative	**Designing:** resemiosis of historical cultural discourses. **Choosing mode:** how film integrates moving images, sound, and visuals.
	Production: realizing mode through media and transducing ideas. **Mediating actions:** how technical tools become thinking tools.
Critical	**Distribution:** showing text on media platforms. Roles of labor.
	Reflection: interpretation in a dialogic process.

Table 2.1 integrates interpretation and the "trunk" of the 3 Cs from Burn and Durran's cultural-semiotic model of media literacy (2007) with the four strata (Kress & van Leeuwen, 2001). I use the term *reflection* as a sort of fifth feature of media literacy, referring to the double process of transformation. Burn and Durran convey a similar idea with their proposed feature of interpretation. However, they combine design and production into one "strata," whereas I find it more helpful to retain them within the four strata suggested by Kress and van Leeuwen. Below I summarize the five key terms for semiotic processes. I attempt to make the processes operational for analyzing data of the students' multimodal design competence. The five terms are unfolded further in this and following chapters.

Discourse refers to knowledge in the plural: "socially constructed knowledges of (some aspect of) reality" (Kress & van Leeuwen, 2001, p. 24). The field of social semiotics adopts two prevalent positions on discourse: as (somehow) existing but immaterial and abstract, and as a realization that appears in many modes of language (Ibid.). Immaterial discourses thus concern our culture; our social, historical roots; and our places. They also refer to a person's past experiences and the current popular media culture. Discourses are realized and observable in our spoken, visual, written, and gestural interactions with one another (Fairclough, 1995). Discourses can also be viewed as associated with, and materialized through, our objects and places—for example, a school's architecture.

Design can be seen as the various creative, innovative uses of "semiotic resources, in all semiotic modes and combinations of semiotic modes" (Kress & van Leeuwen, 2001, p. 5). It is the conceptual side of expression, as well as the expressive side of conception (Ibid.). Design is the realization and materialization of discourse.

Production is the organization of the designed expression, or the material design articulation. It involves sets of skills, such as technical skills and skills of "the hand and the eye" (Kress & van Leeuwen, 2001, p. 6). These skills are evident, for instance, when using film editing software. Kress and van Leeuwen (2001) discuss how design and production are strata that show gaps, as well as how semiotic processes blend. For example, processes blend when a design idea for a film is realized by the same person in production, but gaps are revealed when a design idea is articulated by a different person with specialist expertise, such as a storyboarder or editor.

Distribution refers to how a text, such as a film, is recorded or shown. Kress and van Leeuwen (2001) note that this may not be seen as relevant to semiotic processes because it does not appear to add "any meaning." However, they argue that distribution affects whether a work is high fidelity or not, whether it is seen at home, on a cell phone, or in the cinema. The strata of distribution also refers to "roles of labor" and notions of participation (Goffman, 1981), which I use to correspond with roles in the film groups (see Chapters 4 and 6).

Reflection is a fifth feature in my model and is critical to my understanding of transformation and its ongoing development as a dialogic process, as in the Animating Symbols model (Figure 1.1). *Reflection*, as it is used here, refers to Burn and Durran's use of "interpretation" (2007) and their notions of the developmental process or progression of media literacy.

2.1.1. Understandings of discourse in new literacies.

The key term *discourse* is presented here in relation to approaches that have been loosely termed as a movement called "new literacies." I digress here to offer a brief history of the concepts of discourse and "new literacies," a research direction (or movement) that has been central to establishing social semiotics and my understanding of design as a competence. CDA, developed by Fairclough (1995, 2005), refers to discourse from discursive formation, coined by French philosopher Michel Foucault. Since the early 1980s, Fairclough's research has inspired social linguistics and cultural studies. CDA focuses on how language figures in processes of social change. The theoretical claim is that discourse is an element of our social life that interconnects with other elements and may have constructive and transformative effects (Fairclough, 1995, 2005). The CDA theory and method shape research into complex aspects of contemporary social change. The theoretical perspective of CDA has led to the creation of various methodological frameworks that share three separate forms of analysis: language texts (spoken or written words), discourse as practices (such as processes of text design, production, distribution, and consumption), and social actions (between people) (Fairclough, 1995, 2005; Scollon & Scollon, 2003).

In the 1990s, a coalition of literacy and media researchers called the New London Group, who share an interest in multimodal communication and discourse theories of Halliday and Fairclough, emphasized the idea that several different modalities and media contribute to literacy practice (New London Group, 2000). American linguist and educator James Paul Gee (1996, 2004) and Kress were among the group advocating for a broad view of literacy, including a social and action-oriented view that distinguishes between various discourses and literacies (Gee, 1996). The new literacy studies use various discourse analysis methods to localize the effect of literacy by investigating texts, discourse, and social practice (Hull, 2003; Knobel & Lankshear, 2007). Their move to studying discourse as multimodal, using an open, expanded notion of text and practices, allows for the application of multiple modalities (Halliday, 1978; Kress, 1996; Gee, 1996; Kress & van Leeuwen, 2006). The expanded definition of literacy and the questions arising from the new literacies approach in the last 30 years have played a key role in literacy debates and the alteration of models of how humans learn to use languages and representational systems (discussed in Knobel & Lankshear, 2007).

2.1.2. Before writing: multiple modes in communication.

I now provide a deeper exploration of ideas of design that are related to the cognitive development of writing, referring mainly to *Before Writing* by Kress (1997). I am interested in the transformative inner processes of cognition, by which people learn through designing and interpreting across modes, seen in relation to reading and writing words. To illuminate these processes, it is vital to gain a theoretical understanding of how different modes of representation exist and develop in children. Such understanding provides insight into what is involved when the 18-year-old students in my case study design with multiple modes or modal systems, such as visual, written, and sound modes, to compose their films.

Kress uses the term *logics* to mean the characteristics of particular modal systems. A mix in an ensemble brings such logics together, including the characteristics of how we read the written word in a usual linear sequence and the image that has an open reading path. What Kress (1997) terms the deep logic in systems can be fundamentally different. He discusses logics and cognition in relation to the history of writing, whether pictographic, such as Chinese characters, or Roman alphabetic writing (Ibid., pp. 84–85). Both forms of writing date back approximately four thousand years and derive from picture-writing. As the Chinese characters evolved, layers of abstraction and conventions changed, but the pictorial origins are still evident today. In the Roman alphabet, the mode can be said to have changed as part of the evolutionary transition from Egyptian hieroglyphic writing. As it underwent many transformations (to the Mediterranean region, Persia, and India), the

writing system became abstracted; the images evolved and eventually stood for sounds. This is because the writing system was used by people who spoke different languages. In comparison, the Japanese borrowed Chinese script, but this did not fundamentally change the script's pictographic nature.

Kress (1997) makes the point that children start as pictographers and they enjoy drawing. When learning to write in a Roman alphabetic environment, they must deal with five characteristics of writing logic: "linearity, sequentiality, repeatability, connectedness, and relative simplicity of the individual elements" (Ibid., p. 83). Learning writing in pictographic system, such as Chinese, involves very different logic: "linearity, sequentiality, discreteness, not repeatable but individually differing units, and complexity of the individual units" (Ibid., p. 83).

Kress demonstrates children's cognitive development while learning to write Chinese characters versus the Roman alphabetic and discusses the different learning paths. The *pictographic* script, from pictures to script with characters, provides a path that enables the child to move from the pictorial drawing of ideas to the drawing of characters, a move involving great abstraction and conventionalization. Yet the child remains on more or less the same type of perceptual, cognitive, productive path. However, the path of *alphabetic* script forces the child to start again. The drawing of ideas must be abandoned so that the child can learn to draw the characters of alphabetic writing—the letters. (This is associated with a permanent shift from pictures for many children.) Kress (1997) discusses letters as being "pictures of sounds, not pictures of ideas…[that open up]…a vast conceptual-cognitive gap which is very difficult to bridge" (p. 85). The alphabetic script involves a "breaking" from the obvious, pictorial mode. The pictorial is suggested as our "natural" mode of representing ideas, in addition to directly using the body, such as in speech and gesture.

2.1.3. Discussion: design as concept in social semiotics.

The complex process of designing with multiple forms of discourse relates to ideas about learning and literacy, including how children develop writing skills. Kress (1997) notes that it is important to stress "that print/writing must not be sidelined" (p. 154) in education, for all modes are important; I agree with this. The interest is in encouraging the already existing competence and fundamental interest of children and young people in multimodal forms of texts and meaning-making.

In my data analysis, I address in particular the difference between the simplicity of the alphabet as individual units (letters) and the complexity in pictorial systems. This difference

is crucial for understanding visual modes in relation to sound and writing in my case study. An example is the high complexity of the film storyboards. In my view, the pictorial includes drawing (still images) and overlaps with the sculptural (such as building with LEGO blocks) as well as the temporal and spatial (such as composing films).

In my case study, exploring designing relates to the mix (ensembles) of various modalities of written and visual communication. I see design as a competence in terms of making cognitive shifts, such as when designing storyboards and producing a film technically. The storyboards combine visual and written modes, resembling comic strips. Yet they are also complex, functioning as blueprints and assisting students in planning the film. Storyboard design is preparation for film production—just as an architectural blueprint is a plan for a house. Again, this refers to the idea of the four strata (Kress & van Leeuwen, 2001): design and production processes may blend.

2.2. Understandings of Semiotic Tools.

This section presents the key theories of semiotic tools that build and support my empirically based claims. They stem from Russian educational psychologist Lev Vygotsky and contemporary followers in this area (Wertsch, 1998). Kress (1997) pays homage to Vygotsky's perspective of social action as connecting with mental action in the social semiotic approach to "learning, cognition, and language" (p. 167) and to Wertsch's treatment of these issues in *Mind as Action* (1998).

2.2.1. Production viewed from theories on "semiotic tools."

The filmmakers in my study are examined as potentially developing multimodal design competence, which includes gaining a set of skills in production, including technical understanding involving thinking with semiotic tools (whether virtual or physical). Technical understanding is based on Vygotsky's theories of learning about how humans work and think with tools. Vygotsky focuses on the sociocultural aspect of learning, in which a person's interactions with and explorations of culture, as well as his interactions with the environment, precede cognitive development. He claims, "Learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological function" (1978, p. 90).

This optic on the students' designing and reflecting includes their interaction with tools or semiotic tools, which include physical materials such as paper, pencil, and software. Their interactions with technologies are seen as being related to thought processes (thinking or internal processes); external actions are termed "mediated action" (Wertsch, 1998). Wertsch

(2002) defines mediated action as a combination, or meeting point, of an active agent and a cultural tool. He also uses the term *mediational means* interchangeably with *cultural tool*. Wertsch (following Vygotsky) considers tools as cultural, but they have overlapping psychological and physical components that support our thinking and actions. Psychological or thinking tools are thereby seen as working in tandem with the technologies that support our actions. Wertsch (2002) presents an example involving a new type of pole for the pole vaulter, requiring that the pole vaulter learns to adapt his movements—that is, the pole itself is seen as an instrument of change. He sees an irreducible tension between a tool and a human agent, but not because there is conflict, friction, or resistance. Wertsch prefers the term *tension* to the term *dialectic* because he finds that *dialectic* may connote a synthesis, which is not his intention.

Wertsch views tensions in regards to how a tool enters a system with an agent. This is exemplified in my case study, in which the features of editing software are instrumental for changing the thinking and actions of the student editors. Figure 2.1 is my representation of the sociocultural concept of tools as physical/virtual and psychological/cognitive, based on descriptions in *Mind as Action* (Wertsch, 1998). The dotted lines show that the internal and external understanding of tools overlap and interact in a dynamic tension.

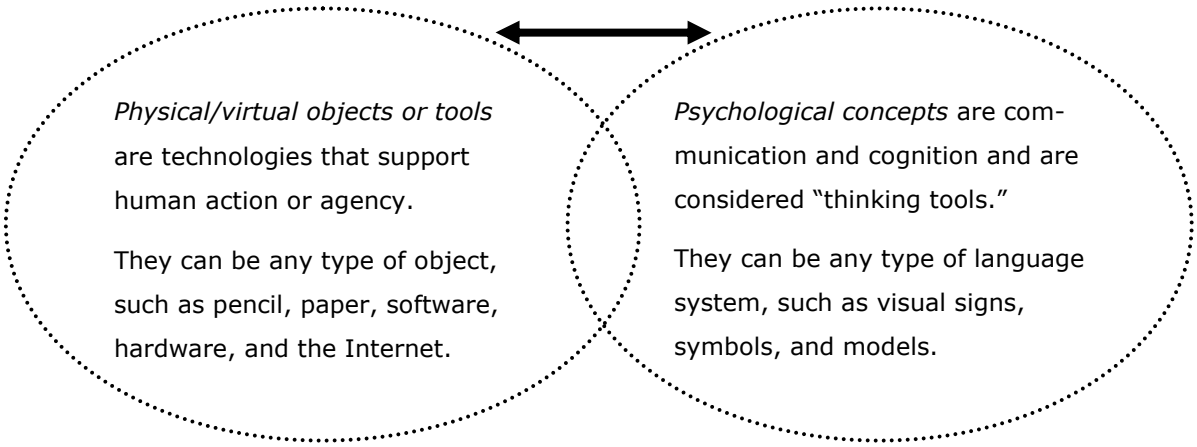


Figure 2.1. Sociocultural concept of semiotic tools, inspired by Wertsch.

An issue that this sociocultural approach to tools and technologies attempts to address is the process of change in how we act and think with our tools. The tools we use every day eventually become invisible to us—or "submerged" (R. Scollon & S.W. Scollon, 2004), such as when a musical instrument becomes a submerged tool for a musician. The tool for thinking can be seen as becoming internalized with our actions and movements in the world (Wertsch, 1998). The cognitive use of a tool is difficult to differentiate from the use of a psy-

chological tool because humans rely on the submerged cognitive support and develop habits of thinking with tools. Technologies that assist in the production of animated films in this study require the student filmmakers to use digital tools and to think with tools, such as editing software, that are (more or less) familiar tools for "thinking."

A theoretical view of tools involves the idea of affordances, which refers to how people interact with technologies and what the technologies offer, or allow us to do, through their specific qualities. The term *affordances* has been used in different ways. It was introduced by psychologist James J. Gibson (1979) and refers to how different affordances of an object allow for different types of actions, such as how a door handle enables the opening of a door. The notion of affordances was adapted into the field of usability and design by cognitive scientist Donald A. Norman (1998, 1999), who is interested in how a person may or may not understand or "perceive" the intention of a design (1999). Kress applies notions of tools and affordances in social semiotics to describe the inherent qualities of the types of semiotic resources available (2005). Kress uses the notion of gains and losses to indicate the different types of affordance offered by different media (2003, 2005; Prior, 2005). The affordances from physical materials or media can sometimes offer a quality that is more suitable for a particular purpose than virtual materials can offer. For example, the material of paper offers a tangible, physical form on which to display and alter ideas and affords certain kinds of cognitive tasks (see also Sellen & Harper, 2002).

2.2.2. Discussion: design and production with attention to cognition.

Since I am interested in how the students learn (seen as designing and reflecting), I must evaluate how semiotic processes are impacted by the production and materiality of semiotic tools. However, an instrumental approach to the precedence of environment and the impact of technologies or tools as suggested in sociocultural theory does not completely fit with my interest. A pragmatic view of learning is more suitable due to its approach to cognitive dynamics from an agentive perspective on the person and his experience. This view includes ideas of prior knowledge, a person's expectations about tools, and social interaction, which I see as contributing to how a person interacts with any kind of tool. Social semiotics is concerned with the historical, social, and cultural—the "social field"—but not, as I understand it, with what can be called sociocultural.

The question of what "precedes" in humans' interaction with the environment is a critical issue in the ongoing debate in philosophy, education, and psychology (Dahms et al., 2007) and is beyond the scope of this empirically oriented thesis. Another important issue to flag for ongoing debate is how gender can be viewed and researched—for example, how digital

media and technological tools may exclude females, while drawing on paper may include females. For my purposes, the strata of distribution in social semiotics, the notion of "mediated action," and the social theories of Goffman offer suitable understandings of the participation frameworks and the roles taken (or given) in the social organization of the film groups. Examining gender differences with technologies involves considering how roles emerge from one's own or others' expectations and prior experience with digital "tools for thinking." Sociocultural theory, the social theories of Goffman, and the concept of affordances suggest that gender and attitudes toward technologies interconnect in a complex entanglement of socialization. The entangled perceptions of expertise and expectations about the tools affect the "dynamic tension" for the individual when he uses a physical/virtual object, such as a software tool. As mentioned in the literature review, digital tools are reportedly used differently by females and males. Thus, it can be expected that technologies impact the individual as well as group collaboration and learning. Since prior experience with tools and ways of thinking with tools can be seen as inextricably linked, any differences (such as those along gender lines) in prior experience may come into play in the students' interaction with technologies in the classroom. I find the notions of affordance and Goffman's participation framework applicable for understanding gender when looking at the individual's agency with tools. Agency and roles are discussed further in Chapter 4.

2.3. Pragmatism as an Optic on Learning

I will now present the pragmatic views of experience that are relevant to my research question and data analysis. These views also relate to understanding aesthetics and media and supplement the evolving conceptualization of the strata of semiotic processes and reflection in terms of multimodal design competence. I draw from Dewey and his followers for understanding experience, the dialogic process of designing, and notions of reflecting as aesthetic. The pragmatic optic continues in Chapter 4, where reflection is presented; there I discuss different models for reflection as theory and practice.

2.3.1. Introduction to the pragmatic tradition.

My approach to learning as it relates to design and reflection is largely based on Dewey's pragmatic theories as central concepts for learning (1933, 1934, 1938). Dewey's work is supplemented by a few of his contemporary followers, including the American Israeli philosopher Richard Shusterman (2000). Dewey greatly influenced the philosophy of art, pragmatism as a philosophy, and educational practice. His work refers also to the approach

of his contemporary George Herbert Mead and to symbolic interaction and cultural studies traditions developed in the United States and the United Kingdom (Blumer, 1969; Mills, 1959/1967; Willis, 1990, 2000). For Dewey, pragmatism was cultural criticism; the aim was to promote morality and democracy in society: "Dewey's cultural criticism promoted pedagogy, dialogue, and open communication as the means for creating the Great Society" (Denzin, 1992, p. 6).

Dewey believed that education should include experiences with the arts because the arts are central to the development of a civil society and can promote a harmonious psyche (Shusterman, 1999). Dewey wrote only one book specifically addressing the aesthetic experience, *Art as Experience* (1934), in which he presents an inclusive rather than exclusive view of art as both high- and low-brow and encourages aesthetic analysis based on specific artworks (Dewey, 1934; Fieser & Dowden, 2006; Shusterman, 2000). Social semiotics refers to the concept of synaesthesia (Kress & van Leeuwen, 2001)—how the senses interact—which is a prime interest in pragmatism. Dewey refers to the aesthetic as a meaningful experience that involves appreciating, perceiving, and enjoying. Shusterman (2006a) continues the pragmatic tradition in the arts and addresses today's aesthetic issues and new artistic forms, such as rap.

2.3.2. Understandings of experience.

The word *experience* represents very different aspects of experience. Experience is distinguished by two different words in Danish: *oplevelse* and *erfaring*, which refer to two closely linked ways to understand experience. One way is from philosophy, in which experience means that which is involved in an individual's sense of self as cumulative, as in *erfaring* (MÆRKK, 2007). On the other hand, *oplevelse* refers to whatever experience has touched a person or caused a reaction, such as a subjective sense of pleasure, gratification, or displeasure. *Oplevelse* is the normative notion of the immediately sensed experience in daily life.

Aesthetic experience is a broad concept. The pragmatic approach to artistic experience views art as an embodied, material type of experience (Shusterman, 2006a). Shusterman (2000) reviews the most common meanings of aesthetics, including the following: a valuably felt and meaningful experience (as art's defining aim), the objective study of beauty and the idea of beauty (connected to nature, fashion, and taste), the study of art (especially conventions of harmony, proportion, and form language), and how something looks (how pleasing it is). Aesthetic experience may refer to an experience of ecstasy (such as the rare "epiphanic" experience from nature or art), but it may also be a mundane, everyday experience (Denzin, 1992; Dewey, 1934).

Dewey stresses that aesthetic experience is both a doing and an undergoing (1934), an experiential and sensory process occurring as an integral aspect of everyday life. The experience of artwork pertains to making or confronting a film text or any other artwork. Dewey believes that art functions as experience, which can be explored through processes of inquiry and experimentation. This inquiry is essentially a search for meaning (see Goldblatt, 2006). Experience is a basic concept, applicable to creating an artwork as a hands-on process of experiential learning, something that is popularly called "learning by doing."

2.3.3. Experience, metaphor, and the body.

The pragmatist view of aesthetic experience as multisensory includes ideas about metaphor and the body. These ideas were further developed by American linguist George Lakoff and pragmatist philosopher Mark Johnson and have influenced the understanding of multimodality (Kress & van Leeuwen, 2001; van Leeuwen, 2005). Johnson has investigated the concepts of meaning, thought, and language as being tied to metaphors relating to bodily experience, with a focus on the sensory, aesthetic dimensions of experience, meaning, and action. Johnson looks at the genesis of abstract conceptualization and reasoning, including thought, language, symbolic expression, and interaction, as being connected with embodiment and the pervasive aesthetic characteristics of all experience (Johnson, 1990, 2007; Lakoff & Johnson, 1980). Metaphor is an idea of how humans transport meanings based on partial similarity and is related to semiotic change—that is, how humans transmit figurative or embodied meanings across modes (van Leeuwen, 2005).

The notion of the embodiment of experience in pragmatism is incorporated in the ideas of multimodality and synaesthesia that are used in social semiotics. Multimodality refers to *synaesthetics* or *polyaesthetics* (Greek, *syn* = together + *aisthesis* = perception), which affects our ability to understand multiple modalities in communication. (*Synaesthetics* also refers to the phenomenon of perceptual links among the five senses, such as how some people "taste" colors.) Johnson (1990) theorizes and discusses how a symbolic presentation leads to reflection by claiming that "a certain image sets into motion an imaginative reflection that results in new insight about the object symbolized" (p. 163), which points, so to speak, beyond itself, to the thing symbolized. Johnson elaborates on how thinking and imagination work by projecting body schemas or structures from one domain onto another—that is, metaphorical structuring—and explaining how these projections of metaphor are a "pervasive principle of human understanding that underlies our vast network of literal meanings" (p. 65). He proposes that humans have "image-schematic" projections of meanings that are embodied schema or gestalts of our experience of the world (Johnson, 1990; see also Joas, 1996, 2000).

The understandings of embodiment are central to my interest in how embodied communication occurs in filmmaking processes, such as the metaphoric meanings (themes) that appear in the films, and how the students "try out" running movements to animate running in their films. As mentioned earlier, *embodiment* also refers to what Kress calls a natural or obvious form of communication. The understanding of metaphor refers to concrete experience, which has consequences for semiotic innovation: "It suggests that new metaphors, and hence new concepts, new ideas and new practices can be founded on the affordances of direct, concrete experiences" (van Leeuwen, 2005, p. 27). I apply this notion of embodiment to the idea of how semiotic innovation is bound with the sensory, aesthetic, and creative aspects of designing a film (see multimodal design competence in Chapter 12).

2.3.4. Training sensory awareness as aesthetic experience.

Dewey (1934) writes that it is important to heighten awareness to artwork through training in sensory awareness and connectivity to diverse artwork. He terms this training of awareness an aesthetic intensity, claiming that "a work of art elicits and accentuates this quality of being a whole and of belonging to the larger, all-inclusive whole, which is the universe in which we live" (Ibid., p. 202). Reflection is undertaken by the entire person; various resources from our past cooperate in using a particular resource (or medium). Dewey describes the notion of synaesthesia in terms of how the senses interact when they encounter art, explaining that "the eye…interacts with eye, ear, and touch. The fine arts lay hold of this fact and push it to its maximum of significance" (p. 203).

In proposing awareness in the arts, Dewey (1934) uses the aesthetic as a concept that also contains the unaesthetic, pointing out that "an unesthetic quality is a separation of means and end" (p. 206). As an example, he describes the brushstroke that signifies how the painter has applied paint; paint leaves tracks that reveal the movements that have been undertaken. When perceived as such, the brushstrokes are an integral part of the aesthetic effect. In this way, the media and the aesthetic effect are united as matter and means. When considering how a student filmmaker may develop sensitivity, we must question how the filmmaker uses the aesthetic effects of a medium because, as Dewey says, "a medium as a medium is the very heart of all artistic creation and esthetic perception" (Ibid., p.207). In other words, the medium (whether paint or any other physical or virtual material) used in a multimodal design process involves gaining "competence" with using the effects of a medium.

Regarding the training of perception, Dewey (1934) approaches the concepts of distribution and interpretation. He questions how to set aside preconceptions in order to open up an artwork and perceive how the material qualities are used; "to look at a work of art in order

to see how well certain rules are observed…impoverishes perception" (Ibid., p. 213). Instead, Dewey recommends striving to pay attention to the ways in which certain parts of a representation (in semiotic terms) are fulfilled, and he suggests looking at the means by which the media express and carry parts of meanings as a way of training aesthetic perception. I understand this as a concern with the unity of the medium as means and ends, form and matter.

Dewey acknowledges the existence of levels of talent and a natural predilection for aesthetic abilities. He finds that this can be seen in a person's "purposeful way" of using simple means to achieve results that speak to others. According to Dewey (1934), the mark of an artist is the ability to see and feel the medium, and this ability can be achieved through training. However, some people are hindered by their preconceptions of art, which in turn confuse their ability to perceive and interpret.

2.3.5. Dewey's notions of transformation.

Dewey's ideas about embodied experience apply to how humans interact with art and how interaction holds the potential for transformation. For Dewey, transformative potential refers to the idea that aesthetic experience with art may extend our connections of what is good, right (moral), and open venues for understanding and action (1934). Dewey sees transformative experiences occurring when people intuit new concepts. For Dewey, one of art's purposes is to convey messages that stimulate reflection on the purposefulness of our lives (see also Goldblatt, 2006).

To understand the learning process revealed by the data, we must understand the hindrances to learning. Dewey (1938) writes that no experience has "pre-ordained value" and that learning is not an entirely positive construct; it also involves hindrances and resistance. Thus, an adequate learning concept must account for the frequent situations in which someone could learn something but does not, or learns something different from what was intended—that is, mislearns or has a negative experience. Perhaps they do not engage, experience rupture, or intuit new venues.

Hindrances to learning and *misunderstanding* are key terms in my findings, and they refer to Dewey's theory of experience and interaction (1938) as revolving around two principles: continuity and interaction. Dewey describes *continuity* as concerning how each experience a person has continues to influence that person's past and future. *Interaction* refers to the specific situational influence of a person's experience, or how an experience in the present is a function of the interaction between that person's past experiences and the present

situation (Dewey, 1938). Prior experience (negative or positive) can be seen as affecting learning in the present and the future.

2.3.6. Discussion: application of the pragmatist approach.

Dewey shares with social semiotics the concept of the unity of form and contents. I find that Dewey deepens my understanding of semiotic processes with his ideas on training sensitivity to aesthetics, materials, and media, such as in the brushstrokes example. Dewey's normative and Romantic tradition imposes a strong ideological frame, purporting that the aim of pragmatism is to build a utopian, democratic society. In the pragmatist tradition, Dewey believes, training in the arts implies attaining lofty ideals, such as self-transformation, ethics, and participation in a democratic society. His ideas on talent, experience, and the mark of an artist apply to my case study. However, I question whether talent and expertise are at play in how the film group members work with "unity" of form and matter. Their interactions appear entangled with expectations about each others' talent and expertise, which aligns with social theories by Goffman.

Dewey (1934) and neo-Vygotskian Wertsch (1998) both point out that fine art has been associated with the work of geniuses whose individual talent is exalted, and they question this focus on the individual. Yet Dewey focuses on the individual perspective to understand the development of learning through experience. Dewey and Vygotsky share other central concerns with developing reflective thinking and learning through mistakes and hindrances, but they offer different perspectives (see Chapter 4).

2.4. Background for the Term Multimodal Design Competence

Below, I review the challenges inherent in using the terms *literacy* and *competence* and my application of terms. My attempt to understand a "multimodal design competence" is rooted in new literacies and the social semiotic position, which argues for expanding literacy to designing multimodal forms of media and argues against a narrow understanding of literacy as simply reading and writing words. Literacy is seen as including the authoring and reading of all kinds of semiotic modes, as well as learning how to design with multiple modes and media.

2.4.1. The contested terminology.

Various objections have been raised to the terms *literacy* and *competence*. Kress (2003) is skeptical of extending the notion of literacy to the many hyphenated forms—computer-literacy, visual-literacy, emotional-literacy, and so on—for two reasons. First, those forms obscure distinctions between modes. Second, those forms obscure what happens when modes combine, such as how the visual mode offers affordances (or logics) but also engages with different modes, such as images with writing, where their logics are combined.

Kress takes issue with today's literacy curriculum, which assumes that a learner (student) should become competent in using an existing, stable system of language (2003). He cautions against teaching elements of critique that are intended to give the learner text analysis skills, as this risks too much distance—that is, "affective, cognitive, cultural and theoretical distance from the technology of representation" (Kress, 1997, p. 155). He prefers competence in what he calls "design," which considers "new, innovative forms, which are a response to the maker's analysis and understanding and allow the designers to go beyond the forms which exist" (p. 155). Note that this presupposes analysis and attention to design as actions of redesigning. Design, which describes the process of inventing language, contrasts with a view of competence, which suggests that there is a stable set of skills that can be acquired once and for all (Kress, 2003). Kress (1997) calls for more precision relating to literacy as design, but does *not* see it as restating "progressivism in education" (p. 155).

Kress points to both *design* and *interpretation* as terms for how people understand semiosis (meaning) by articulating outwardly made signs and interpreting inwardly made signs. Semiotics is an interactive, developmental learning process whereby children understand that signs are not only filled with meaning but can have multiple meanings. The meaning of signs is not produced by the sign on its own, as Kress (2003) points out, but by our interpretation. Kress (2003) uses a concept of the multimodal in texts, where text expands to include "any instance of communication in any mode or in any combination of modes" (p. 48). His terminology retains an understanding of the distinct logics of the respective modes while arguing that they co-exist, mix, and are multimodal (such as writing and images on Web pages). Social semiotics consistently refers to the idea of designing as a multimodal ensemble, which encompasses different systems of logics and offers multiple layers of meanings.

2.4.2. Discussion: definitions of competence.

My position on the use of the term *competence* presents three main problems:

1. The terms (especially *literacy* and *competence*) are contested theoretically, definitions vary across domains of practice, and *literacy* is an Anglo American word and tradition.
2. I grapple with questions regarding the perspective of the individual as impacted by society or vice versa.
3. Social semiotics is mainly a theory about representation, not learning. However, Kress in particular discusses literacy and he advocates for the redesigning of language and seems to prefer the term *competence* in relation to learning.

I find the terms *literacy* and *competence* problematic but do not have a strong conviction about alternatives. Kress's use of *design* is the best choice, although *design* as a vernacular term signifies many types of activities. *Competence* is also a problematic term because it is (over)used as a policy word in the discourse of the "knowledge society," yet this also serves to challenge older definitions of *literacy*. I use *competence* as it applies to designing and transforming signs and symbols in multiple modes because I find it awkward to apply *literacy* to visuals, and *literacy* does not translate into Danish.

Multimodal design competence in my case study refers to describing the learning aspects of semiotic processes such as exemplified when the students in the case study select how to use semiotic resources for their films. Their selection of one type of semiotic resource over another involves the application of prior knowledge across a range of communicative experience and potentially leads to the forming of new connections in an ongoing process of learning. They design with an ensemble of modes, including the linguistic units of the alphabet and visual signs and symbols, such as in their storyboards. They use speech and gestures when communicating with one another to negotiate a production plan. They use software programs for recording and editing.

There are problems with a semiotic, social linguistic approach to a process of learning, but I see language development as intermodal and bound with cognitive development per Halliday, Vygotsky, and Dewey. I have chosen to use the term *competence* to cover semiotic processes as learning activities and apply it to my synthesis of analysis in Chapter 9; I provide a profile of competence in Chapter 12.

3. Social Semiotic Theory about Representation

In Chapter 3, I present the social semiotic theory of representation, referring mainly to external semiotic processes with signs and symbols and our multiple modes of communication. The focus is on moving images and animated films. The background to social semiotics is presented in order to distinguish it from other semiotic approaches. Animation is examined as an example of media convergence and new digital forms of film production. I present the notions of mode, modality, media in social semiotics, and resemiotization, which draws on Australian linguist and social semiotician Rick Iedema (2001). I also apply Iedema's model of film levels to my film data (see Chapter 6). Particular animation resources are reviewed and discussed in relation to external representation and the complexity of a multimodal text, exemplified in the ensemble of a film.

3.1. Background to Functional, Social Semiotics

Social semiotics looks at what multimodality accomplishes and describes social processes of semiosis (Kress, 2003, 2005; Kress & van Leeuwen, 2001, 2006; van Leeuwen, 2001, 2005). The word *semiosis* derives from Greek, the verb *to mark*, and is used by Charles Sanders Peirce (1839–1914), the father of American semiotics and an early pragmatist (Kress, 2003). Peirce describes the process of semiosis as social, and this is a triadic and cyclic process. In a moment, I explore this further. (A related but different approach is semiology, referring to Ferdinand de Saussure [1857–1913].) Peirce's approach embraces the social dimension of interpreting signs. This relates to social semiotics' interest in how people exchange meanings through the applied use of language. It also relates to how Halliday approached the metafunctions of language in relation to children's motivation to acquire language, because learning language serves certain purposes or functions (Halliday & Hasan, 1985). Content (as in *what* is signified) is generally studied in social semiotics as discourse, and the analysis takes a form-oriented approach. Texts are generally questioned as to *how* content is formed, *who* forms it, and *who* is the audience: "who does it—for whom, where, and when" (van Leeuwen, 2005, p. 123).

3.1.1. What is a sign in social semiotics?

Peirce's influence on social semiotics concerns the uses or interpretations of signs and symbols by readers and users. Signs are hereby seen both as arbitrary (as when a sign has no

particular resemblance to what it signifies) or motivated (as when a sign resembles what it signifies). Signs are seen as using conventions to signify, such as when a heart is used to signify love, and even become clichés. The field of social semiotics leverages three well-known concepts from Peirce about signs: icon, index, and symbol (van Leeuwen, 2005; Kress, 2003). However, these distinctions are not used much in social semiotics, and I do not apply them. Symbols (which Peirce also terms *general signs*) are arbitrary, becoming associated with their meanings by convention and usage—for example, the octagonal red stop sign. Peirce viewed the fundamental relationship between the signifier and signified as always intentional (or motivated). The important point is that a reader (or a speaker or viewer of a sign) may alter the signification (or meaning) of the sign in any local context. Since social conventions vary according to context, signs can never be considered constant determinants of meanings in all contexts. Signs cannot function in an absolute sense in Peircian terms, an idea that has been adapted into social semiotics (Kress, 2005; Peirce, 1894).

3.1.2. Signs or semiotic resources.

The ideas of signs as semiotic resources that we design or innovate are key ideas from social semiotics. They concern how users or agents contribute and develop new semiotic resources. An innovation potentially involves the recombination of semiotic resources that are new and unique (van Leeuwen, 2005). Simplified, semiotic change is brought about in two ways: using metaphor (figurative language that transfers meanings from one place or domain to another) and connotation. With connotation, the word *white* signifies abstract concepts (such as whiteness); while with denotation, the word *white* signifies concrete white things (such as snow) (Ibid.).

The idea of semiotic resources originated in the work of Halliday, who argued that the grammar of language is not a code but a resource for making meanings. Van Leeuwen (2005) extends semiotic resources to "the actions and artifacts we use to communicate" (p. 3), whether they are actions or texts involving our voice, gestures, or technologies. Social semiotics prefers the term *resource* because it avoids the suggestion that a sign stands for something definitive, when it really changes through use and has plural meanings (Ibid.). Van Leeuwen points out that semiotic resources are signifiers, actions, and objects; to investigate them, one must distinguish their theoretical, semiotic layers of meaning (consisting of past uses and all possible uses), from their actual semiotic use, "constituted by those past uses that are known to and considered relevant by the users of the resource…uncovered by the users on the basis of their specific needs and interests" (p. 4). However, since people have a tendency to forget past uses, we reconstruct history.

In social semiotics, the reason for making semiotic choices is called *aptness*; van Leeuwen (2005) points out that "in most cases we choose signifiers because we see them as apt for our purposes of the moment" (p. 49). Kress (1993) argues that meaning is produced (in an internal process of interpretation) from the dynamic interaction of the interpreter, their interest, and the "characteristic" of the sign (object or text), he says, "signs are always motivated by the producer's interest and by characteristics of the object" (p. 173).

Social semiotics attempts to combine ideas (from de Saussure) of the synchronic and the diachronic system. A *synchronic description* refers to a given moment in time, or a freeze frame. A *diachronic description* is a historical description, a description of how things change and evolve over time. Semiotic change is brought about over time and through metaphor and connotation. Social semioticians aim to inventory semiotic resources and investigate how they are used in specific contexts, yet they also contribute to developing new semiotic resources and new ways of using those that exist (van Leeuwen, 2005). However, this agenda differs from de Saussure's; de Saussure, according to van Leeuwen, downplayed the diachronic (historical) description in reaction to his own time period. Van Leeuwen (2005) attempts to reestablish the tradition of the diachronic narrative alongside the synchronic system. He wants to combine iconographic methodology with social semiotics because iconography deals with subject matter or meaning by establishing how the subject matter of images (whether representing people, places, or things) refers to the viewer's understandings (van Leeuwen, 2001).

3.1.3. Using iconographic methods for analyzing levels of meaning.

I review here my approach to the diachronic using iconographic methods, which I explain further in Chapters 5 and 6 in relation to my data construction. My aim in this section is to add a few relevant perspectives from iconography to build my understanding of how and what symbols signify layers of meanings. The iconographic approach's strong historical and cultural focus widens the social semiotic approaches to discourse as discussed previously (see also Mirzoeff, 1999). Iconography offers a way to analyze current and past uses of symbols and signs—for example, how a painting contains references that its contemporary audience would have spotted (Rose, 2001). In other words, diachronic references are obscured now. However, I follow van Leeuwen and other modern adaptations, which do not go deeply into the history but rather open up for alternative meanings and connections across time.

3.1.4. Typology of signs in iconography.

Panofsky defines three kinds of visual interpretations in iconography, which operate on three levels. I refer to reinterpretations of Panofsky by van Leeuwen and British visual culture educator Rose (2001) (see also Toft, 2006) in relation to Panofsky's original terms:

- Primary level: representational meaning involves natural subject matter. This is also termed *pre-iconographic*.
- Secondary level: iconographical symbolism refers to conventional, iconographic meanings.
- Intrinsic level: iconological symbolism involves the broader symbolic, iconological meanings that go beyond the generally accepted conventions.

The primary level of representational meaning is basic and can appear elementary. Panofsky presents the example of recognizing that someone you know raises his hat to greet you—seemingly simple. As Rose (2001) points out, in methodological terms, this primary level parallels the close observation that is used for compositional interpretation. This level of meaning represents our basic understanding. For example, we may recognize that a man is lifting his hat but not know that this is a greeting. The example of the hat is thus not simple; it involves the realm of association that suggests that the lifting of a hat is a greeting.

The secondary level of iconographical symbolism involves realizing that lifting a hat has symbolic resonance. An interpretation of the convention of tipping a hat belongs to, represents, or personifies some motif, theme, or concept. These conventions are often more easily recognized when they are not in our own time period or culture.

An intrinsic interpretation level (the iconological symbolism) addresses what ideas the image represents on a cultural level of significance. The person lifting the hat is showing his whole personality and background in the style of hat and the lifting. According to Rose (2001), Panofsky suggests that the meaning of the hat-lifting image is ascertained from underlying principles that reveal attitudes of a nation, period, class, or other categories. An image such as a hat-lifting condenses meanings. Van Leeuwen (2001) writes that the interpretations may move away from meanings and conventions that, for example, a given artist would be aware of, and extends to "an interpretation of which the artist may not be aware…but which is nevertheless indispensable to analysis" (p. 101).

3.1.5. Discussion of use of theories of symbol representation.

I apply a diachronic approach in order to understand "how things change and evolve" (van Leeuwen, 2005, p. 26) and a synchronic approach to analyze the compositional levels of the

finished films (the single frames in relation to the whole). I use the terms *sign* or *symbols* to generally describe signifying systems.

A critic of the diachronic, iconographic approach includes American art theorist Nelson Goodman (1976, 1978), an iconoclast who aimed to banish imitation, resemblance, copying, and all such relatives from "being foundational notions in aesthetics and epistemology" (Mitchell, 1986, p. 152). Goodman saw history as nonexistent and provided a system for routes of reference, but not for roots of reference. The iconographical approach executes a thorough, exhaustive analysis to disclose a fairly universal meaning across sociohistorical factors. However, I do not apply this level of thoroughness to disclose the universal.

As social semiotics generally considers texts as open and polysemic, there is some interest in the historical uses and conventions (the diachronic), which is the approach I adapt along with a focus on action. For instance, in my presentation of the storyboards for the films *Metamorphosis* and *Out-breakers*, I use aspects of the Panofskian approach because iconography is oriented more to the subject rather than the form—that is, it "concerns itself with the subject matter or meaning of works of art, as opposed to their form" (Panofsky, 1970, p. 26). The iconographic analysis of the storyboards is also informed by my analysis of video data transcripts and excerpts of storyboarding actions.

3.2. How Do Moving Images Offer Systems for Designing Meaning?

Contemporary researchers (Burn & Parker, 2003; Burn & Durran, 2008; Iedema, 2003; Riley, 2006) are contributing to the body of work by Kress and van Leeuwen. They are revising the functional, semiotic understanding of moving images as systemic resources for expressing meaning. Below, I discuss moving images with a view of language as a system for representing meanings; this implies that language is not a closed, finite system but is contingent upon how we apply language (or discourse) in our ordinary contexts for making "semiotic choices" (Kress, 2005). Moving images and animated images have particular semiotic systems and a modal status (truth value) of the fantastic.

3.2.1. Metafunctions of language.

Halliday's idea of metafunctions of language point to three main functions: representational, interpersonal, and constructional. Visual researcher Howard Riley (2006) adapts Halliday's model and identifies the three functions in relation to narrative film:

1. The representational (or ideational): the construction of representations of the world in the film itself.
2. The orientational (or interpersonal): the way that film can embody the filmmaker's ideological stance as well as position the film audience in terms of their mood and attitude toward the film's narrative.
3. The organizational (or constructional): the way the other two functions are realized.

The metafunctions are referred to with different terms, hence the alternative terms in parentheses above. Each of the three metafunctions contributes to meaning-making as a sum total, describing the ways in which particular meanings are foregrounded (or backgrounded) and can provide alternative readings (Burn & Parker, 2003).

The utilization of the three communicative functions is pertinent to how authors and filmmakers achieve their intended meanings by selecting from and combining available semiotic choices. The metafunctions describe the dynamic between the finished film text and the filmmaker, where the filmmaker designs the film as a form of communication that the viewer interprets. Any interpreter uses various sets of logics to construct meanings across multiple modes; we link words, images, and sound to interpret a film. Van Leeuwen describes the conjunction of modes or layers of meaning in multimodal texts (2005). The composition is a cohesive relationship encompassing how we interact with a text and how we assign meanings to it, such as how we understand a particular constellation of verbal, visual, and sound (acoustic) modes. Social semiotics argues that the selected images and music are always representational and meaningful, and that the constellation of images and music is what generates experiential effects on the interpreter due to his or her own associated meanings.

Each mode has its own logics and reading path (Kress, 2003), which, in the case of images, is relatively open. The various elements of images interrelate in a complex way. A multimodal text combines various modes, achieving a highly complex reading path; it is a transformative work in the sense that various interpretations are open and are layered (Kress, 2003; Monaco, 2000). Kress (2003) points out that we can "read" visuals at an early age, without special training, because it is "natural" to do so—whereas with written literary text you need to learn the alphabetic code.

The metafunctions point toward whether or not the filmmaker's (or author's) intended meanings were achieved in the text. The constructional function concerns whether the intent was realized and how it may become altered or hindered, thereby impeding the intended representation. The interpersonal intentions of the filmmaker may not be realized in

their representation, and the film audience may interpret meanings differently due to different sets of associations. This is related to the complexity of interpreting multimodal texts.

3.2.2. The representation of motion.

The representation of motion is of particular importance here. In a book about integrating the multimodal approach in the subject of English (Goodman, 1996), van Leeuwen differentiates still and moving images based on spatial and temporal affordances (1996). He also discusses moving images in *Introducing Social Semiotics* (van Leeuwen, 2005). The difference revolves around different vocabularies (or lexis), such as what visual signs are available to represent the motion of people, places, and things. Van Leeuwen notes that the difference between the semiotic resources available in still and moving images is that still images use only actions and transactions, which are realized by vectors or directions of reading paths. Moving images have vectors as well, but they also have the *illusion of movement*, realized by the movement or material process of actions and transactions. These actions can be either figurative (eyes blinking, legs running) or abstract (shapes changing form); both figurative and abstract actions signify motion (van Leeuwen, 2005).

A filmmaker can represent motion in three different ways:

1. The motion of the camera and of the people, places, and things depicted.
2. The editing possibilities of images as sequences.
3. The ways in which moving images can combine with other modes (speech, music, and sound effects).

Still images have different resources available to represent motion in order to indicate an interaction between the elements of an image, such as what van Leeuwen terms the *reactor-vector phenomenon*. These patterns of actions and reactions essentially refer to processes of perception. Interactions between elements in a still image are thus revealed through different graphic means. Our reading depends on conventions that we know. As an example, Van Leeuwen describes the different conventions for representing the thought process of a character in still and moving images. In a still image, such as a comic strip, the convention of a "thought bubble" shows a character's thinking process (McCloud, 1994; van Leeuwen, 1996). Conventions for showing the thought process in moving images include blurring outlines or frames in a film sequence, or using montage (Monaco, 2000). These conventions serve as a semiotic means for telling the story, such as by improving the understanding of the narrative's point of view.

The interpersonal aspect can be dynamic in both still and moving images. However, in moving images the dynamic position of the camera can create more levels to the relationship between the viewer and what is depicted; the dynamics can unfold over time and use angles in space. The camera position and camera changes serve the narrative, indicating who is telling the story and influencing how the viewer identifies with the characters. Van Leeuwen points out two forms of dynamicizing distance and angle: subject-initiated, such as a film character appearing to move away; or camera-initiated, such as the camera appearing to move. These are often combined in a film text. However, it is important to note that animation does not use actual (physical) camera movements, but rather uses the illusion of a camera moving.

Methodologically, I analyze the animated films in my data by using a matrix (levels) for live action film based on Iedema (2001), six levels of "tele-film analysis": frame, shot, scene, sequence, generic stage, and whole to narrative (see Table 6.2). I also apply Halliday's metafunctions and van Leeuwen's ideas (1996, 2005) as described in Chapter 6.

3.2.3. Defining animation in relation to mode and modality.

In this study, I call animation a *mode*, though this stretches the meaning of the term. Every mode has what Kress terms "fitness for purpose," which refers to how a mode has particular affordances for the purpose of showing something; every mode has a unique affordance in terms of representation (Kress, 2003). I suggest that the mode of animated film, due to its frame-by-frame construction, is useful in representing the modality of the fantastic or fictive. Animation enables the staging of imaginary scenarios and is well suited for representing inner thoughts and the imagined, such as dreams and fantasies. Consider how motion in moving images can be presented in a multitude of ways and levels, or represented to different degrees. In social semiotics, the question of modality focuses on how the text negotiates its meanings and stages its context. In animation, the modality ranges from hyperreal to fantasy—that is, representing objects moving in fictional spaces and beyond what we perceive as the "real" world.

Modality and *truth value* are terms adapted from linguistics. *Modality* usually refers to modal status, such as whether a word indicates that something is necessary or merely possible—for example, it *must* happen or it *may* happen (van Leeuwen, 1996, 2005). Modality is a useful term for indicating the truth value of a representation and is a crucial issue in communication; it involves the question of message reliability. Viewers are made to ask whether what and to what degree what they see or hear is true, factual, or real; how it is presenting the world; and whether it is a lie, a fiction, or something outside reality (Kress & van Leeuwen, 2006).

The discussion of modality is thereby important for critical interpretation and reflection, or "media literacy," in terms of how a meaning in any given proposition (visual, verbal, or otherwise) is represented as true or not. The concept of modal status is essential in visual communication because visuals can represent people, places, and things as though they are real. They can also represent them as unreal, although everything is a representation. Yet there are degrees of truth that pertain to how we represent visuals as though they are imaginings, fantasies, or caricatures (Kress & van Leeuwen, 2006). Films use particular resources (or codes) and conventions for designating the modal status. The understanding of the modality and judgments of the degree of reality are social and depend on what is considered real, true, or sacred in the social group that is the intended audience (Ibid.). A different film audience may not understand the modal status as a filmmaker intends.

3.2.4. Background on animation production.

In order to clarify the field of animation, which is the focus of the study, I present an overview of its professional production practices; I believe these will aid understanding of the case study. As mentioned earlier, newer digitally animated texts, such as CGI, are ubiquitous in everyday semiotic texts, especially in the popular texts that young people encounter, including computer games and animated films such as *Shrek*. The exposure to various styles and uses of animation may have contributed to the student filmmakers' confusion about the production of animation in the classroom.

Animation involves unique technical aspects of production, involves special creative resources (expressive qualities), and has many purposes. Many people associate animation with children's fairy tales or the animation (coming alive) of imaginary toys and creatures (Furniss, 1995). Animators working with mainstream Disney cartoons also developed experimental animation (Furniss, 1995; Israel, 2006). Animation as an experimental art form dates back at least to the Surrealist art movement, including Canadian animator Norman McLaren and others who formed the International Animated Film Association in the 1960s (see ASIFA, 2006). Contemporary visual artists blend installations, film, simulations, performance, and animation, as indicated at a major conference on computer graphics (Hertzfeldt & Judge, 2006) and avant-garde art event (Documenta, 2007). Newer, commercial animated films are geared toward children and adults; some use irony, such as *Shrek*, while others have serious themes, such as *Spirited Away* by Japanese animator Hayao Miyazaki (2002) or *WALL-E* (Pixar Animation Studios, 2008).

According to British animators Peter Lord and Brian Sibley (Lord et al., 2004), animated films are distinguished from one another in two main ways:

1. Whether physical objects are used, which can include drawings and 3D objects (such as claymation or puppet animation).

2. Whether the animation is virtual 3D or CGI, as in the *Shrek* film series.

In cel animation (*cel* refers to cellulose drawing material), used for Disney classics such as *Bambi*, every frame of the animated movie consisted of physical drawings. But today drawings are digitally transferred directly to film and are manipulated by computer (Furniss, 1995; Lord et al., 2004). This type of production differs from live action film, which is built from actions recorded as film footage; animation is made frame by frame, and when the single frames are put into motion, the illusion of the inanimate becoming animated is created (Miller, 2003). The still image is a single frame, the smallest unit for moving images in animation, where 24 frames make 1 second of film. The viewer sees motion due to an optical illusion, the phenomenon of persistence of vision (Lord et al., 2004).

New production technologies make it possible to create hybrid forms of moving images, such as the techniques used in *The Matrix* trilogy. Film artist and theorist Lev Manovich (2001, 2006) suggests that the future belongs to hybrid forms of moving images. To him, hybrids are emerging from new techniques that blend traditional animation, cinematography, and computer graphics. New hybrid forms make it possible to move set locations away from "real," local sites to imaginary locations—for example, transitioning from the oft-used "back seat of a taxi in Copenhagen" to an exotic location such as Mars (Nielsen, 2005).

3.2.5. Discussion: analyzing film using social semiotic theory.

A main component of my argument is that interpretation is a reflection process; it follows that it is vital to understand more about how we interpret a multimodal text, such as a film. Kress suggests that the actions of reading images and interpreting films are not "easy" just because they are immediate or natural. I argue that this apparent "ease" is exactly why designing a film appears surprisingly challenging for the students in my case study.

The students struggle to distinguish between physical and virtual animation. I want to clarify that the students' production involves physical objects as computer-assisted, stop-motion animation. Digital software programs allow for the capturing and editing of single frames and the editing and mixing of sound. Most of the student film groups use the collage technique with a mix of drawings, cut paper, and found objects. One film group also uses part of a human body (an arm), a technique called *pixilation*. The case study does not involve virtual, CGI animation production. (The animation set-up in the classroom is de-

scribed in Chapter 6, and the students' misunderstandings of animation are analyzed in Chapters 7 and 9.)

3.3. Composition: The Representation of Meaning in a Multimodal Design

I apply two central concepts of multimodal design to data: composition and resemiotization. *Composition* is defined as the cohesive principle of texts; it refers to the film's representational function, including an analysis of a film's levels and functions and the idea of interrelationships among the represented subjects (such as vectors) that I have reviewed. *Resemiotization* is applied to analysis, in regards to how signs transform across modes and why the particular signs are selected. This relates to the idea of inter-textuality or how various texts in various forms refer to one another and are transposed. The term *inter-textuality* encompasses a broad set of concepts, from audio/visual to written texts, and includes notions of genre (style) and cultural traditions (Agger, 1999), whereas I use transformation and resemiotization.

3.3.1. Resemiotization as transformative dynamic.

The notion of resemiotization relates mainly to how I attempt to understand student filmmakers' intentions with their films and how they use semiotic resources to "enact" their intention. The filmmakers deal with the organizational functions of language (from Halliday and social semiotics) when putting their films together according to their own intentions and for their intended audiences.

According to Iedema, one limitation of multimodal analysis is that it considers the complexity of texts or representations "as they are," whether film, sound, or virtual, computational texts (2003). Iedema believes it is important to take a multimodal approach to meaning-making that complements textual analysis with a more dynamic view of social processes (2003). He argues that multimodal analysis would do well to pay less attention to how semiotic constructs come about, or how they transform as part of larger dynamic processes. Instead, he suggests focusing on the social side of process-based logics that governs how material meanings mutually transform one another, which he refers to as resemiotization. He advocates paying attention to what he calls the transformative dynamics of meaning-making processes in a particular context by tracing translations of meanings across social actions and analyzing why or to what means the particular meanings are used.

Iedema (2003) suggests two analytic directions for questioning resemiosis: "(1) tracing how semiotics are translated from one into the other as social processes unfold, as well as for (2) asking why these semiotics (rather than others) are mobilized to do certain things at certain times" (p. 29).

I am inspired by Iedema to take up resemiotization in the following two ways:

1. Interpreting *how* signs and symbols alter across modes, using the notion of transduction (Kress, 2003) for studying the semiotic process during design and production.
2. Asking *why* these particular semiotic sources are selected, how they carry particular conventions from previous texts, and how the production technology impacts design.

The analytic aspects refer to inter-textuality, and, arguably, inter-textuality is not a new phenomenon. But new media afford new means for finding, copying, and redesigning texts, such as with software. One impact of digital media is the alteration of design, production, and distribution, as discussed earlier. Digital technologies allow for the easy copying and remixing of various resources (Gilje, 2008; Ito, 2005) and raise questions about the interrelatedness of texts. Observing the active process of design and how it involves choosing semiotic resources may provide further insights into how new meanings are invented in the process of multimodal design.

3.3.2. Discussion: composition, resemiotization.

My data provide numerous examples of the resemiotization of texts and the dynamics of an evolving text design, where meanings transduce from one type of mode to another. This notion of resemiotization applies to analyzing how the students rework heterogeneous designs as sources and the ongoing changes in the layers of meanings in an evolving design/production process. For example, in my data, the spatial, circular quality of a Greek vase influences the spatial and temporal qualities of the animated film text. The actions of finding the vase involved downloading an image from the British Museum Web site, a ceramic vase that has been transduced to a photograph, and so forth. During the design and production process in the classroom, the vase is used on a storyboard and transduced from still to moving images. My interest includes interpreting *how* the particular signs and symbols alter across modes (transduce) and *why* this occurs, based on the particular classroom context. The idea of interconnected texts and mediated actions resemiotizing from one action, object, or discourse into another underlies my discourse analytic approach to data on the filmmaking process (further discussion in Chapters 5 and 6).

4. Synthesis of Theories on Learning and Representation

This chapter synthesizes the applied theories that have already been presented and adds the topics of agency and reflection as a recursive process. My synthesis is not a neat combination; instead, it is an attempt to show how the applied theories differ. This chapter includes a presentation of three pragmatist models. Agency relates to the pragmatic theories that concern the effect of prior understanding of what signs represent, as well as to the Peircian view of interpretation as open and polysemic (having multiple meanings). Reflection as a recursive process refers to how reflection on signs is ongoing.

My research question asks *how* the students are designing and reflecting, but also relates to questions of *how* they bring their notions of self (agency) into designing. This concept as it is discussed here includes their social interactions with others during filmmaking, the notion of cultural narratives (from Bruner), and how others interpret their films. Therefore, I look further into theories of the dynamics of self and others in the *dialogic* process of thinking about representation of meaning. This dynamic is central to any developmental process of agency, identity, and learning.

4.1. Combining Theories of Reflection

As discussed earlier, human representation of meaning is understood in social semiotics from a pragmatic and experiential viewpoint of metaphors that are grounded in bodily experience. Below, I delve further into Dewey's central concepts of experience and reflection from *Experience and Education* (1938) and *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process* (1933), in which he presented thoughts on problem solving in educational practice, based on the utilization of a student's past experiences. These books deal little with the aesthetic experience and are more concerned with thinking skills, as well as with how to promote or train thinking skills in the classroom through inquiry and reflection as a unified process. However, Dewey's principles of inquiry, continuity, and action overlap with *Art as Experience* (1934). Dewey suggested that having experiences is key for bringing about reflection as an active thought process. An important concept for my case study is that reflection is provoked by action and by situations of uncertainty, doubt, or difficulty. Learning involves "an act of searching, hunting, inquiring, to find material that will resolve the doubt, settle and dispose of the perplexity" (Dewey, 1933, p. 12)—that is, hindrances can be opportunities for learning.

4.1.1. Three reflection models based on a pragmatic tradition.

The three pragmatic models for reflection presented below combine views of the critical and aesthetic processes of thinking and inquiry. I include them because they help answer the question of what reflection is in relation to the transformation of texts. These models have contributed to the generation of my model Animating Symbols illustrating the notion of a double processes of transformation (Figure 1.1). In presenting the models, I hope to continue the discussion on reflection from Chapter 1. Further discussion of the models and pedagogical implications appears in Chapter 9.

The pragmatist approach considers the practical actions in the world and applies research into social practice, including teaching. Pragmatic models of inquiry-based learning and reflection have been adapted by various followers for different fields, due to the pragmatic view of learning as a lifelong process that includes school, art, literature, mass media, work life, and citizenship. Reviews of Dewey's (1938) framework of the reflective process have been simplified into two or three phases (for instance, Fieser & Dowden, 2006; Rattleff, 2006). The three phases often appear roughly as follows:

1. Defining a problematic situation that has practical dimensions.
2. Isolating a particular problem and ways to address the problem as an inquiry.
3. Reflecting on how the problem was addressed and pursuing the problem in the abstract.

The third phase here refers to cognition and the development of a theory to provide an understanding of a problem's practical dimensions. The phases are not meant to be necessarily sequential; rather, they are overlapping and cyclical in an ongoing process of transformation, as Figure 1.1 suggests.

The three models I present below concern aesthetic and critical reflection and were developed for creative, arts-oriented fields. All of them contribute to my understanding of reflection from my classroom-based data and the interviews with students. The models provide diverse perspectives on reflecting about filmmaking. The first model addresses the interpretation of the arts as both appreciative and having critical social dimensions. The second model addresses the question of how to train reflection based on studies of how professionals work, such as how architects develop ideas and critique their own process. The third model addresses reflection in terms of teaching schoolchildren about design processes.

The first model of reflection is by Shusterman (1998), reworked from an art appreciation model by American British poet T. S. Eliot. This model is a two-stage theory of art appreciation, "the first stage involving a sympathetic, tentative acceptance of the work and its world-view, the second a conscious ideological critique of that world" (Shusterman, 2000, p. 148) (see also Shusterman, 1988). Shusterman proposes that in the first stage, we address how we accept the artwork's (or text's) imaginary world and how we respond to it. This first stage is imaginative; we as viewers enter a fictional world, such as ancient Troy. Or we may fail to get involved because the work is uninteresting, lacks cohesion, or keeps us from surrendering to it (Shusterman, 1988). In the second stage, we develop reflective processes through perception and what he terms *critical consciousness* based on our own critical review; we reflect on our own relationship to the work and embrace broader ethical and social considerations. Shusterman raises a concern that the consumption of everyday media as popular enjoyment may never lead to any sort of reflection (1999). Thus, educators are challenged to both enable students to have aesthetic experiences and teach them how to reflect on those experiences (Ibid.). Confronting artwork may transform us in various ways (Ibid., 1988), and readers should encounter art, literature, or other media that demands something. This idea is based on the belief that the more we read, the less indoctrinated we become; exposure to opposing views and projections into imagined worlds helps us understand ourselves (Ibid., 1988).

Applying Shusterman's model of reflection to filmmaking entails approaching the film critically to elicit what the experiences with other worlds mean to the viewer. The model entails challenging viewers to respond to the film by thinking about their own worlds and identities, or even "indoctrination."

The second model of reflection, by American educator Donald Schön, is based on studies of how architects and other arts professionals go through processes of reflection in action and on action (Schön, 1987a). *In action* refers to the understanding that occurs while in the concrete process (such as an experience with hands-on designing); *on action* refers to idea of reflection as looking back on an experience. Schön (1987b) developed the model by studying how professionals solve problems by constructing an understanding then reframing the situation, which allows them to generate and apply the knowledge and skills of their profession. Schön also applies the model of how professionals reflect in action to how students should be trained. He suggests making reflective practicum, or what he terms *simulacrum*, which is a simulated world of professional practice that can be applied by students to run experiments and to learn by doing with others (Ibid.).

Applying Schön's simulacrum model of reflection to my case study involves establishing a simulated practice based on how a professional film team would work and experimenting

with producing ideas and critiquing films like a filmmaker. (This model is close to what the animation teacher suggests.) The simulacrum model involves an approach that could include the semiotic, such as thoughts about how films represent meanings, how the ideologies of filmmakers may influence films, and how the film's audience may interpret meanings.

The third model of reflection, by educator Richard Kimbell, is based on empirical studies of the discipline of design and technology, a subject taught in U.K. schools during the 1990s. Kimbell made a model showing "the interaction of internal images and expressions in drawings" (Kimbell et al., 1996, p. 24). He discusses the potential for developing deeper, clearer thinking as a double process relating to "concrete expressions that allow us to examine the reality of an idea" (Ibid., p. 24), as well as the potential for developing solutions in an iterative process of action and reflection. Kimbell's evaluation of design and technology indicates that a reflection process is central to achieving "good pupil performance." In classroom instruction, he proposes a balance of active designing (drawing, modeling, making) with reflective appraisal (identifying strengths and weaknesses in the design work). Thus, action and reflection processes integrate: "Action forces issues into the daylight and in reflecting on these issues, we raise further directions and possibilities for action" (Ibid., p. 13).

Applying Kimbell's model to student filmmaking involves making time for reflective appraisal and using iterations; this is important for developing ongoing, deepening reflections. It encourages several cycles of designing and reflecting on the students' own film texts to support their experiential process with opportunities for their own appraisals.

All three models refer in different ways to the recursive nature of reflection. Burn and Durran (2007) discuss a recursive model for the progression of media literacy, which they propose includes the 3 Cs as well as development across different cultural types and aspects of texts, critical analysis of discourse (rhetoric), and hands-on creative and expressive design work with texts. The progression involves cycles of experiences over time. However, my understanding of progression differs from Burn and Durran's (2007) proposed view of "ascending from the concrete to the abstract" (p. 154). I refer to pragmatism with its view of the concrete and abstract as parallel, not lower/higher, and also a *dialogic* theoretical view on the development of reflection over time, as unfolded below.

4.1.2. The dialogic process.

As discussed earlier, the term *dialogic* used here refers to processes of thinking, such as how any "designer" is in a continual dialogue with multiple aspects of any text, with people, as

well as with previous works and authors. The dialogic in relation to learning refers to holding multiple interpretations and standpoints for reflection that develop over time (which I illustrate as a dotted orange line in Figure 1.1). The dialogic is useful theoretically in order to conceptualize the activities in the classroom where the students develop, critique, and alter their films, which are all parts of a classroom practice that exemplify a "learning dialogue" (Wegerif, 2007). Below, I review how the dynamic of the internal and external processes can be seen as a dialogic "interanimation" (Ibid., 2008) in a process of reflective learning. Again, the dialogic refers to a process that does not necessarily lead to synthesis, but rather to the holding of multiple interpretations (Ibid.).

English educator Rupert Wegerif provides relevant perspectives on dialogic philosophy of education and on dialogic approaches to teaching thinking and creativity. I want to address a central strand from Wegerif's *Dialogic Education and Technology* (2008) about the idea of mediated action with external tools used in thinking and problem solving (referring to Vygotsky and Wertsch, as reviewed in Chapter 2). Wegerif discusses how Vygotsky's contribution was not the idea that cognition is mediated by signs and tools, but that the idea can be applied to individual psychology and the development of the "higher mental faculties." However, Wegerif points out that Bakhtin's dialogic perspective was developed as a contrast to the dialectic that underlies Vygotsky's assumptions (referring to the dialectic process by which two apparently opposed or conflicting ideas become a unified whole). Instead, Wegerif draws on dialogic claims, including references to how infants learn by pointing at objects. Pointing takes place within the infant's relationship with his caregivers (for example, when the infant points at a dog, the caregiver might say "Yes, what a nice dog"). Pointing leads to the abilities to interpret and use signs in the context of a dialogic relationship with a caregiver, who assists in filling those signs with meaning. Wegerif illustrates this with the figure *Self-Other-Sign*, adapted from Hobson and Moscovici (Wegerif, 2008, p. 42), reproduced below.

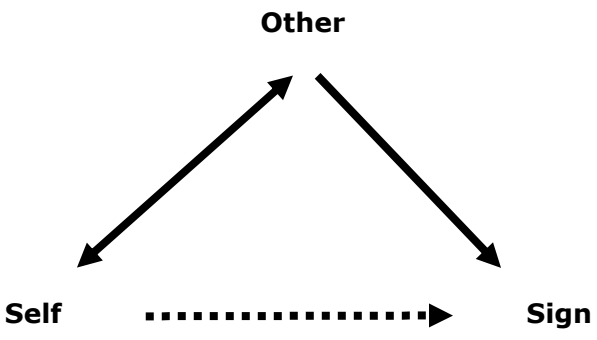


Figure 4.1 Self-other-sign (reproduced from Wegerif).

Wegerif compares this self-other-sign triangle to Vygotsky's models of mediation by tools, where the relationships are *between things.* The dialogic has a different focus on the interrelationships *between voices* (Wegerif refers here to Bakhtin, 1981). The dialogic account I take from the Bakhtian influence, which has also influenced social semiotics, is an account of language and culture as an "inexhaustible field of perspectives that open up in the space between people in dialogue" (Wegerif, p. 43). While the Vygotskian view suggests that the aim of education is the mastery of tools, the dialogic suggests that the aim is going beyond the self to develop an understanding of the other and, through the specific other, otherness in general, according to Wegerif (Ibid.). This aim appears very close to the pragmatic model of reflection by Shusterman and Eliot, presented earlier.

4.1.3. Discussion: my understanding of reflection.

My understanding of reflection is based on a pragmatic optic of the complex, interactive processes whereby we as individuals reveal ourselves and our world by our meetings with texts, including mass media and fine art. This harks back to the feature of reflection and its critical and aesthetic perspectives (see Tables 1.1 and 2.1) on media literacy, where interpretation can involve appreciating texts' aesthetic qualities and being critical toward texts (the traditions are discussed in Burn & Durran, 2007). I intend to capture the dialogic nature of reflection, seen as the hands-on, concrete aesthetic experience of "designing" that also involves cognitive aspects (as Dewey suggests).

Reflection concerns prior, cumulative experience that evolves over a continuum of time with a view toward individual students' previous experiences. (This view prompted me to undertake a data analysis of individuals; the portraits are in Chapter 7.) The theories of Vygotsky and Dewey influenced each other, but their views of agency differ significantly. I take a more Deweyan focus on the individual as agentive, which includes the cultural and social field, and I believe this is closer to social semiotics. On the other hand, the theoretical tradition of Vygotsky is sociocultural and more focused on the environment's impact on the individual.

The three models presented in this chapter unite learning to think (abstractly) with learning to do something (concretely); the idea of these processes as parallel is a keystone of the pragmatist view. The models apply to considerations of how designing a film text (or any multimodal text) may lead to reflecting on the means and meanings of communication. But consider also that with reflection in school and everyday life, the *potential* exists for ideological critique or the forcing of issues into the daylight; however, deeper reflection does

not necessarily develop from viewing or designing a film. The ideal of promoting reflection is important for teaching literacy, which includes considering the hindrances to learning. Paradoxically, the potential for learning is great if people learn from mistakes. Inspired by Dewey, I suggest that people continually learn—but they may not learn what was intended. This is essential for building an understanding of learning and the inner processes of transformation. A pedagogical and ethical consideration is how reflection can be framed in a classroom. I adopt the pragmatist point that the response to and critique of a text involves internal processes of questioning the text's meanings and worldview; I believe this is central to developing aesthetic sensitivity and critical consciousness (as Shusterman terms it) of texts.

4.2. Studying the Cultural and Social Interactions in Semiotic Processes

In my case study, I aim to uncover the cultural and social aspects of design as a process of re-inventing language, asking *how* students solve the design problems that arise, including selecting semiotic resources and working in a group, and *how* they reflect on the semiotic processes. Again, this appears to be a double process of transformation. Hands-on designing is an inquiry into how to represent meanings, and students must deal with *what* they want to communicate and to *whom*. However, the semiotic processes of filmmaking also bring up questions of *who* they are (the agentive self), including who they are when collaborating with others in a film group.

Within the limited framework of this thesis, I cannot pursue reflection related to identity (agency) deeply. The idea of a "social field" (Kress & van Leeuwen, 2001) refers to a viewpoint of the individual students and their development of learning as being embedded in social discourse. The sociocultural approach is less concerned with specific biographies of individual lives, while social semiotics is more concerned with individuals, who are seen as making up the whole of our culture and history as a social field (Ibid.). The social field includes the concept of how students interact with one another and use the discourses in their culture.

I want to highlight the contribution of Bruner (1997, 2006), especially his *Acts of Meaning* (1990). Bruner influences my belief that discourses are narratives that can be seen as autobiographical and cultural; he says, "It is man's participation in culture and the realization of his mental powers through culture that make it impossible to construct a human psychology on the basis of the individual alone" (1990, p. 12). Human discourse is called the material manifestation of a cultural and cognitive psychology. Making narratives is a basic

drive for individuals who wish to construct meaning, and this meaning-making process is situated within the context of our culture. Culture thus provides the "symbolic systems…[that constitute]…a very special kind of communal tool kit whose tools, once used, made the user a reflection of the community" (Ibid., p. 12). Culture enables individuals to construct meaning. Bruner's ideas of "shared narratives" refer to how our culture has "shared meanings" and narratives.

Bruner (1990) believes there is an interwoven relationship between identity of the self and society, supporting the idea of "locating Self in not just private consciousness but in a cultural-historical situation as well" (p. 107). Bruner proposes two universal themes for how the self adapts and forms identity: human reflectivity (including our capacity to move on from the past and alter the present), and the human capacity to envision alternatives (other ways of being, acting, striving) (Ibid., pp. 109–110). Bruner refers to Vygotsky's theories of social interaction in the development of cognition but is also inspired by Deweyan pragmatics. In line with Bruner's thinking, the Hallidayan metafunctions consider how individuals understand one another through the meanings they communicate.

4.2.1. Notions of roles applied to the classroom study.

As mentioned, Goffman's notions of roles and group interactions are helpful for my analysis of the roles students perform and the ways in which they negotiate with one another in their film groups. Goffman explores how people take up positions and form relationships with others in a social, interaction order, a framework adapted into MDA (Goffman, 1981; R. Scollon & S.W. Scollon, 2003). The idea of "interaction order" helps me understand the procedures by which a person establishes a role in any social process, such as how an insider in a group may aspire to gain more influence and gain or keep a leadership position. In this case study, an insider may aspire to be a leader as a film instructor in a film group. Someone who is not a leader but is marginal in a group may attempt to gain a "footing" (Moghaddam et al., 2008) or a more central position and thereby a right to intervene in decisions. Again, in this case study, this person may seek to intervene as an editor in a film group. I do not distinguish between roles and positions in my case study; I see the terms as existing on a spectrum (Ibid.). My analytic strategy in using notions of roles and positioning is to discuss the group interactions broadly as social group interactions, and I find it useful to apply "roles" from professional filmmaking (see Chapter 7) and in regards to the students' interaction order in the school context as a whole.

Goffman insists that verbal and nonverbal behavior be examined along with the context of that behavior (1981). The context of upper secondary school, especially the Danish college preparatory line (*gymnasium*) is suggested as having "winners and losers" by teacher and

evaluator Inge Heise (discussed in Illeris et al., 2002, pp. 90–91). Heise wrote reports on upper secondary school from perspectives on teachers and students (1995, 1998). In order to understand roles in the school context, I refer to Heise's organization of students into three main types:

1. The winners are the academic and committed students. However, they vary widely in feeling secure or self-directed as learners. Despite being winners, they can have an unstable sense of being competent, successful, and popular.
2. The school-weary are burdened by homework and have an ambivalent identity as students. For the weary, getting through the three years of school is a victory, and they often have a negative identity as learners. They question the purpose of school and express a feeling of being "trapped."
3. The losers struggle to get by in terms of passing exams and/or being socially accepted. The losers can appear broken down by the school experience, and some can be characterized as not fitting in scholastically. This group contains the weaker students, those who are tired of school and/or who have personal issues that interfere with their schooling.

My intention in presenting ideas of roles and identity and "winners and losers" is to provide a background for the presentation of group roles. The social group interactions, such as filmmaking roles and the division of tasks in the classroom's film groups, are analyzed as individual portraits and group roles in Chapter 7; see especially Table 7.1, listing the roles and activity levels in two film groups. Roles in terms of methodology are discussed further in Chapter 5.

4.2.2. Discussion: agency and roles.

In combining approaches from different fields to create a working theory for my data analysis, various seams appear. As mentioned, my ideas of reflection refer mainly to Dewey and to the definitions of literacy applied in social semiotics, as reviewed in Chapter 2. However, other theorists, with their perspectives on discourse analysis and the dialogic, contribute as well to my understanding of the basic human drive to construct meaning in our culture. Dewey's pragmatism suggests a strong connection between practical experiences (such as hands-on filmmaking) and reflection as active thinking processes. Reflection can be provoked by doubt or difficulty, is recursive, and builds over time.

Bruner's idea of shared narratives considers the concept of "self" in culture and brings up questions such as, is it a singular and coherent entity? Or do I see it as a fictional construct? The self, which has various tensions, must be reckoned with. A distinct and discernible

intention seems to be a fictional construct and is part of an intangible inner "experience." Can the self be seen as various identities or presentations of self? I attempt to illuminate this question by using Goffman's microsocial perspectives on human interaction processes and forms of talk. My notion of self relates to a text, as in the self-other-sign interaction (see Figure 4.1). This view is dialogic, so the other is very important; we share and "learn" to design and reflect with others in our culture. The metafunctions of Halliday encompass studying not just the form of the text by also the reader's or viewer's interpretation. This reveals how the text relates to a viewer's personal concept of self or agency. A person's notion of self interacts with other people's notions of self, which impacts the interpretation of a text's meanings. For instance, a student designing a film in my case study is reflecting on his own self and his understanding of the self of another person, whether it's a co-designer of the film or a prospective member of the film audience.

Considerations about the constructs of self and intent are intrinsic to many post-structuralist theories (referring to Fairclough and Foucault). My view of the dialogic stems back to the influence of Peirce on social semiotics and their rejection of the idea of a stable relationship between a signifier (a sign) and its signified (meanings). Rather, signs establish meaning through the recursive relationships that arise when signs mediate the relationship between what they signify and what their *interpreters* interpret as meanings (see interaction modeled in Figure 4.1).

A final point for discussion is a comparison of Dewey and Vygotsky. They have similar ideas about activity and learning as a development process; they both refer to how learning involves prior experience and the making of conceptual changes; and they have similar views of how inquiry and experimentation may bring up and resolve problematic (unresolved or negative) aspects of prior experience. However, they differ in their views of education. Dewey concentrates more on the ability of the individual to question through inquiry and experience (1938), while Vygotsky stresses the sociocultural process. This difference is a consequence of their differing views of agency. Dewey often portrays a child as a "free agent," motivated to learn because of goals based on his or her own interest in the activity; however, Dewey opposes some of the "progressivism" that his followers applied to his earlier work. Vygotsky suggests a greater control by the social environment—in other words, a teacher can serve as a mentor or as scaffolding, structuring activities (see Dahms et al., 2007).

From a Deweyan perspective, one might suggest that if a designer or filmmaker encounters a problem with representing an idea, then they should focus on their agency and personal interest to support the process of inquiry. Essentially, personal interest in an inquiry about the world has primary importance, and this process has precedence. From a Vygotskian

perspective, on the other hand, one might emphasize problems relating to the social process of learning, suggesting that new concepts appear first socially and only gradually become psychological. These perspectives are very complex; they are greatly simplified here. They exist on a spectrum and they do not exclude each other. My view of precedence is more on the side of pragmatism, but I highly value Vygotsky's contribution to the social.

Following up on my examination of theories about learning in relation to representation, I want to expand the discussion of five key terms that form my approach to multimodal design competence (Table 2.1) and define these for my purpose. These five terms are the four strata of semiotic processes—discourse, design, production, and distribution (Kress & van Leeuwen, 2001)—with a fifth feature of reflection, which refers to my model Animating Symbols (Figure 1.1). The approach to media literacy and young people's media production in *Media Literacy in Schools* highlights the aspects of the 3 Cs, cultural, critical, and creative (Burn & Durran, 2007). Burn and Durran suggest that the most critical dimension of media literacy involves critical judgment, pleasure, and taste but is also intricately linked to our sense of self, or identity. Burn and Durran suggest a view of media literacy as transformative, creative, and involving internal mental operations. Researchers can study only the transformative work that is externalized, "most immediately as speech, but later as writing, drama, visual design and so on" (Ibid., p. 2), as it is not possible to "know" an author's intended meaning.

Section II: Methodology and Data Analysis

5. Methodological Approach

Chapter 5 clarifies my overall methodological considerations. The chapter opens with a review of the various methodological approaches used for data collection. This is followed by a lengthier introduction to the interdiscursive methodologies for data analysis deriving from the theories of analyzing discourses of social action that became my analysis "toolbox." Thereafter, I present overall criteria for qualitative research and discuss these in light of my toolbox. Finally, I review ethical issues including how I obtained permission and established new names for the participants in the study. The specifics of how I planned the data collection and my particular methods of data analysis are explained in Chapter 6.

5.1. Methodologies Used to Collect the Data

As mentioned in Chapter 1, the case study was initially planned as a design-based educational research study (see Ejersbo et al., 2008; DBRC, 2003, 2005). The methodologies for data collection are largely visual methodologies used in design, education, and art and design practice, stemming from visual ethnography and anthropology. The integration of visual materials in interviews and as research objects is not new. My use of visual methodologies is based on research methodologies that explore the interactions between humans and visuals and capture human interactions by using visual methods, such as photographs and video. The following introduces why I chose to use videotaping and photo-elicitation and provides a brief background of their traditions. The ethical implications are discussed at the end of the chapter.

In videotaping the actions of filmmaking in the classroom, I intended to document the actions and relate the filmmaking process to the resulting student films. The assumption was that the videotaping would reveal layers of actions and practices that could not be captured by writing notes or observing the interactions within the film groups. This kind of messy, embodied, multilayered activity is difficult to record other than through audio/visual data. Videotaping has a long tradition in visual ethnography and is generally associated with visual anthropologist Malcolm Collier's work in the 1960s (Banks, 2001; Collier, 2001; Mirzoeff, 1999; Norris, 2004b; Rose, 2001).

My aim in collecting photos as part of the interviews was to gain insight into the students' backgrounds. Therefore, asking interviewees to generate their own images was crucial. Using photos in an interview situation to elicit responses also refers to Collier (2001) and is a method that can stimulate memories and serve to "instigate conversations about a particular subject" (van House, 2006, p. 1464) in a discursive exchange. Participants taking

their own photos for photo elicitation are generally reported as providing more detailed answers because personal meanings and narratives about the photos unfold (Carter & Mankoff, 2005) (see also Banks, 1995; Clark-Ibáñez, 2004). My aim was to elicit student discourses about various texts, including popular mass media and visual art. Therefore, I asked the students to take photos, write, and make drawings in a journal as a "cultural probe," an idea that is based on asking informants to probe their everyday culture in the sense of gathering and creating visual texts about their own lives. The cultural probe method involves informants in making journals about their everyday life and stems from an ethnographic, arts-based approach used by professional designers (Gaver et al., 1999) and inspired by art movements such as Dadaism, surrealism, situationism, and conceptual art. A similar method in art education is the elicitation of responses about art by asking students to make learning journals (Davies, 1999). I used the cultural probe method (informants making journals and taking photos) as a way to bring the students' general cultural background and everyday life into the interview situation.

5.2. Data Analysis: Reviewing MDA as Part of My Toolbox

The methodologies for analyzing discourses of social action in the classroom are derived from the theories of discourse, text, and action presented in the preceding chapters. MDA has informed my approach to analyzing the actions of designing as concrete, multiple modes of discourse when we communicate (Scollon & Scollon, 2003) as well as my view of how the concrete representations relate to the more abstract discourses. For example our abstract discourse of knowledge is embedded in our school building layout or the school schedule. My examination of discourses is in regards to the discourses that exist in language (discussed in Kress & van Leeuwen, 2006, p. 24). My interest is the students' representation of meaning in the films from a semiotic, cognitive, cultural, and agentive perspective.

As mentioned, I had difficulty finding a way to operationalize my video data in order to analyze the interactive dynamic in the filmmaking processes among the text (or sign), individual agent, and group interactions. The video data revealed interesting periods of fragmented conversation, such as about moving the figures in a film, but sometimes there was no talk at all. I became aware of the importance of capturing and understanding these silent periods and what I came to see as the design process's embodied actions. This led me to investigate how their interactions were interdiscursive and multimodal. They were using what Kress calls natural language (the body) and obvious language (the visual), and their

use of software as a tool for thinking, for example, was becoming "submerged," referring to Wertsch (1998), as discussed in Chapter 2.

5.2.1. Introducing MDA.

MDA (alternatively called Multimodal Discourse Analysis; see LeVine & Scollon, 2004) considers texts in their social and cultural contexts with the aim of exploring the actions individuals take with texts and the consequences of those actions. As mentioned, it is a theory and methodology related to CDA (Fairclough, 1995) with a contextual focus; it endeavors to move beyond verbal data and "mere" textual analysis for social research. It is generally useful for research in the areas of linguistics, applied linguistics, and ethnographic research, and it is applied in the humanities and the educational field. MDA combines methods from close linguistic analysis of social interactions and also refers to the cognitive, sociocultural psychology of Wertsch (1998) and Goffman's concept of the participation framework (1981), which all share an interest in context. MDA refers to visual and social semiotics and Kress and van Leeuwen's work regarding discourses in place, or how the physical and material characteristics of signs "give meaning" (R. Scollon & S.W. Scollon, 2003).

The main books I used for my adaptation of MDA are *Nexus Analysis: Discourse and the Emerging Internet* (2004) and *Discourse in Place: Language in the Material World* (2003) by linguists and ethnographers Ron and Suzie Wong Scollon, and Ron Scollon's *Mediated Discourse: The Nexus of Practice* (2001b) (see also Ibid. 2001a, 2006). Another relevant book on MDA is *Discourse and Technology: Multimodal Discourse Analysis*, edited by linguists Philip LeVine and Ron Scollon (2004), in which scholars discuss the role of the Internet and "real life" activities in educational contexts and workplaces. In LeVine and Ron Scollon (2004), the contribution by Sigrid Norris provides a framework for how to account for various modalities, including material layout, gesture, posture, and gaze, as well as spoken language, described in more detail in Norris's *Analyzing Multimodal Interaction* (2004a). I am inspired by her approach to using video stills for video analysis (Ibid. 2002, 2004b; Jones & Norris, 2005). Van Leeuwen (in LeVine & Scollon, 2004) confirms the significance of the visual mode in discourse analysis.

Ron and Suzie Wong Scollon apply the notion of mediated actions to occurrences in selected moments in time and space (2004). This idea can reveal how people interact with all the different types of discourses in a context. Thus, actions and experiences intersect, and, together, are constantly transforming; "each of these can be thought of as having a history that leads into that moment and a future that leads away from it in arcs of semiotic cycles of change and transformation" (Ibid., p. 160).

There are three areas of MDA, which are illustrated in Figure 5.1, *Nexus Analysis of the Social Action*. A *nexus* refers to a "site of engagement," as in a context for the action that is the object of study. Figure 5.1 is adapted from a sketch of areas to consider for data analysis (Scollon & Scollon, 2004, p. 154). As illustrated below, exploring the central "social action" involves doing a nexus analysis with consideration of three areas:

1. *Discourses in a place*, which are discourses that cycle through and from many places and uses.
2. *Interaction order* of a group of agents.
3. *Experience* of any given agent as an individual, and his or her history.

The three areas are illustrated and explained below, as is "social action."

Figure 5.1

Nexus Analysis of the Social Action, Based on Scollon and Scollon

This figure is my interpretation and illustration of the three areas of the MDA framework as applied to the case study. The "social action" refers to the core question behind a study, such as my question of how the students are designing and reflecting in relation to transforming texts.

Discourses in place is described as semiotic aggregates, a coming together of many types of discourses for both place (location, environment, or site), and time (time units, schedules). In a classroom, the dominant discourse is pedagogical but embedded in long-standing traditions. I also want to discover how the students communicate about their filmmaking ex-

perience in the school context—that is, their discourses about aesthetic experience in relation to school and their culture at large. This communication is revealed during filmmaking (see Chapter 8) and also through interviews (see Chapter 7). I include their texts, such as films, as a type of discourse.

Interaction order is a basis for clarifying an aspect of interaction to determine the human or social factors that create the scenes that constrain or allow our actions (Scollon & Scollon, 2004). This area is related to the roles people take or perform in social settings and the positions that occur in our everyday social interactions (Goffman, 1981). It can be difficult to separate individual actions, such as during the filmmaking process, from the interactions involved in orienting oneself with others. Therefore, I use the data from the individual level of portraits to reveal more about the group order in the film groups.

Experience refers to the self and to others. In MDA, this area refers to a term from Japanese phenomenologist Nishida, *historical body* (as cited in Scollon & Scollon, 2004), which basically refers to how the self is anchored in a bodily basis of experience. But I prefer the term *experience* and refer to similar ideas on synaesthesia, prior experience, metaphor, and embodiment as used in pragmatic theories (Lakoff & Johnson, 1980; Dewey, 1934). Experience relates to my interest in the individual agent (filmmaker) and his or her identity and implies embodiment, as used in this thesis. Figure 5.1 attempts to illustrate how experience is embodied by showing a few of our senses: eye for sight, hand for touch, ear for hearing. When uncovering experience in my case study, I also address the question of how designing or filmmaking involves interactions with others in the school, the positioning of groups, and the individual (referring to Goffman). In regards to experience, I want to discover how the students bring their previous experience into the classroom; how they use that experience with film, art, and technologies; and if, or how, this experience enables them to carry out their roles in the film groups.

The social action is an aggregate of the three areas, which are seen as united, and refers to a study's primary question. In this case, that question focuses on the designing and reflecting processes of the students, the "double" process of transformation seen as relating to multimodal "design competence." MDA supports "mining" data for indicators of design competence as a framework for analyzing real-time actions of designing texts, actions that are physical, material, and visible.

The MDA approach seeks to uncover the overarching social problem at issue (Scollon & Scollon, 2004) in real-time events. These actions are related to and reflective of larger social discourses and practices; thus, the micro level of actions is intertwined with various chains of events or trajectories (Ibid., 2003, 2004).

In data analysis, it is impossible to treat the three areas equally. My main focus is on the aspect of discourses in place, especially the discourses called texts in the context of the school. Using the MDA approach to texts involves seeing texts as cycling through discourses, which are taking place in the school and social field. This cycling of text and action in context also underlies the use of the term *resemiotization* (from Iedema) and the social semiotic view of texts and redesigning or innovating meanings, which are made from combining layers of meanings in new, unique compositions.

5.2.2. Applying MDA to this study.

I adapt my use of MDA, particularly my description of action as multimodal, mainly from Norris and Ron and Suzie Wong Scollon. In their spirit of the aforementioned and other scholars at the Centre for Discourse Studies at University of Aalborg, who encourage the ongoing development of methodologies, I adapt MDA for my analytic purpose. I support my analysis of action with the more textual and form-oriented social semiotic approach, including textual analysis of films and storyboards as visual compositions.

The core concepts of MDA involve terms that I review here. The *site of engagement* is the real-time window through which the intersection of social practices occurs and can be studied. When a site of engagement is repeated regularly, it is referred to as a *nexus of practice*. It is "the convergence of social practices in a moment in real time…[that] opens a window for a mediated action to occur…The concept of the site of engagement focuses upon the social practices that enable the moment of the mediated action" (Scollon, 2001a, p. 6). I prefer to use the term *window* to describe my chosen examples of data, referring to nexus of practice.

The smallest unit of analysis is the mediated action. The notion of action is that it is taken by an agent with the available cultural tools and with a constellation of social practices (pointing, talking, sitting, using software) that makes a certain, concrete mediated action possible in a site of engagement. My concern is primarily with the mediated actions of filmmaking by filmmakers (students, or agents) who are designing with the available cultural tools, seen through the "windows" of data. Therefore, my analysis focuses on revealing a few examples of the mediated interactions of animation filmmaking activities during classroom time.

Actions are seen as existing within a given social practice based on school, with its traditions and conventions. One aim is to capture how the students constitute their social *membership* status or positioning through certain knowledgeable ways (expertise) (referring to Goffman, 1981), such as doing and talking "design;" according to Scollon, "bounded membership entities of inclusion and exclusion out of the nexus of practice must be studied to

see how the transformation from practice, action, and habitus to person, characteristics, and identity is performed through discursive practices" (2001b, p. 158). The individual agent has roles and acts through the discourses available. For example, the students are agents performing a filmmaking discourse within a school practice and site rather than, for example, in a professional film studio.

The students use the tools or the "mediational means," which refers to the idea of cultural tools as physical objects and psychological concepts that provide semiotic means for the agent and are "transformed" dynamically through social practice (R. Scollon & S.W. Scollon, 2004), as discussed in Chapter 2. MDA has a dynamic optic of the conditions for the transformation of mediational means through action. It stresses looking at whether the action is limited in some way by the participants, discourses, objects, places, or other factors (Ibid.).

5.2.3. Reasons for multiple approaches of social semiotics and iconography.

In order to understand films as visual, as well as other types of multimodal texts, social semiotics is very useful for understanding visual syntax or "visual grammar," but it is not fully adequate for my purposes. Van Leeuwen (2001) argues for combining social semiotics with iconography because iconography can deal with the bits and pieces, or "visual lexis," of images, an area about which social semiotics has relatively little to say. Hence, combining one or both approaches of visual semiotics and iconography is worth considering, as it "would form a very useful complement" (Ibid., p. 92) to social semiotics.

Below, I elaborate further on this combination in order to clarify why I chose it. Van Leeuwen (2001) points to the difference between visual semiotics and iconography—that is, visual semiotics is restricted to textual arguments, whereas iconography uses both textual and contextual research and thus "uses arguments based on intertextual comparison and archival background research" (p. 117). The traditional subject of iconography is art history, and iconographers use documentary research to support their interpretations by investigating the circumstances under which objects (of art) were created. While iconography is usually applied to work with historical perspectives on art, van Leeuwen argues for its usefulness in the analysis of contemporary images as well. He points out that iconography and visual semiotics have limitations since they do not have much to say about visual grammar or the combination of meanings. One problem he addresses is that though the approaches go beyond simply inventorying the meanings of the individual people, places, and things in images, and though they "put meanings together" to show how they add up to a coherent whole, "they do not usually identify specific patterns for this or use specific

methods to put the meanings together" (p. 92). I am interested in examining both the visual grammar of a storyboard in terms of how the meanings are composed as a whole (that is, the combinations of meanings across modes, based on social semiotics) and the visual lexis in terms of smaller units for building meaning (that is, the bits and pieces of visual codes and how the style of drawing refers to other styles).

However, van Leeuwen (2001) has pointed out that iconography sometimes puts the meanings together but generally confines itself to a specific style, school (such as a school of painting), or period. He suggests that there are possibilities in combining methodologies because iconography and visual semiotics are "useful for investigating the representational ('denotative') and symbolic ('connotative') meanings of the people, places and things (including abstract 'things') included in different kinds of images" (p. 117).

There are some limits to what social semiotics can offer because it refers to a linguistically rooted and form-oriented tradition of language, which brings with it a focus on addressing finished texts. Although texts are seen in a "social field," social semiotics is not generally concerned with analyzing (in a fine-grained way) the agentive, creative process of filmmaking. The social semiotics approach is powerful for analyzing the finished texts, but I believe it needs to be supplemented with other discursive approaches to analysis. The weakness or limitation of social semiotic analysis is that "it reads the tele-film text irrespective of the specific individuals who were involved in its creation" (Iedema, 2001, p. 201). Problems such as conflicts and constraints during filmmaking, or technical and practical circumstances around making choices with the text, cannot be addressed by social semiotics. But the view of action in MDA serves to analyze the films as text with action *together*—providing an analytic system for operationalizing multimodal theories and exploring a wider spectrum of "external" mediated discourses. Thereby, I try to gain more insights for developing a model of the "internal processes" reflection.

Simplified, social semiotics and iconography mainly apply to analyzing text, while MDA applies to analyzing the interaction between humans and texts. I use multiple methodologies for discourse analysis (social semiotics, MDA, and iconography) to see if, when combined, they allow for constructing more parts of the answer to the research question.

5.2.4. Discussion: combining discourse analytic approaches.

The MDA approach is instrumental for my analysis of the interactions that occur during the filmmaking practice (in Chapter 8), with a focus on how the students compose and re-semiotize while designing their films. This focus narrows in on an analysis of semiotic and social processes of storyboarding and onion skinning (see an explanation of these terms in

6.3.2) and discussions about films in a student critique session. Doing an MDA-based "nexus analysis" helps me conduct a close analysis of actions in the film groups. My main theoretical frame of social semiotics helps me do a close analysis of texts. I apply MDA to the filmmaking data because social semiotics does not offer methods for studying interactions of the processes of designing, which I need to explore my research question.

While MDA and social semiotics share roots in discourse analysis, they offer different yet complementary lenses for viewing the action of designing meanings with signs, symbols, and the agents. For my purposes, MDA and social semiotics present different problems in exploring agency and the intentions of the authors in relation to how they design and reflect. For example, in *Reading Images* (2006), Kress and van Leeuwen discuss the meanings of children's paintings and drawings, but they paraphrase what the children say about the pictures in their examples and offer little detail about the materials available at the time of drawing or the way the drawings were altered along the way. Methodologically, I would like to better understand how they consider context as shaping the design process, however challenging the proposition. (As mentioned in the literature review, however, other researchers oriented toward social semiotics, such as Jewitt (2003), give context more consideration.) If sign-making is seen as being rooted in both our material world and our embodied senses, the sensory process must also be accounted for in contextual analysis despite the many limitations for doing so.

Through MDA methodology, I can explore embodied, situated design actions as discourse, along with texts as discourse. However, I need social semiotics to analyze texts as symbol systems. It offers depth and detail for analyzing texts as visual modes of discourse, such as the storyboards and finished animated films. For my purpose of building a case study of multimodal literacy or competence in the design of a film, the combination of approaches to discourse analysis assists in tracking both agents and texts as transformative.

5.3. Considerations of Research Criteria

The following is a review of standard criteria for doing qualitative analysis, including the trinity of generalization, reliability, and validity as conventionally defined regarding qualitative research (Kvale, 1996; Rose, 2001; Schrøder et al., 2003) and applied to my discursive approach. Any research study needs to explicate how the decisions for using methodologies fulfill the standard criteria.

5.3.1. The trinity of generalization, reliability, and validity.

The validity criterion involves dealing with issues of truth and knowledge, deep philosophical issues that can be dealt with only briefly in this thesis. According to Kvale, the issue of valid knowledge concerns the question of what truth is as well as the three classical criteria of correspondence, coherence, and pragmatic utility, which have different positions within philosophical traditions. What Kvale (1996) has termed the practical implications of validity deal with "validity as craftsmanship in research, as communication and action" (p. 236) and concern whether or not a researcher is using a method that investigates what it is intended to investigate. A pivotal concept for ascertaining validity with qualitative methodologies involves determining the quality of craftsmanship—as Kvale explains, "continually checking, questioning, and theoretically interpreting the findings" (p. 241). The methodologies used in the study are discursive constructions, produced by me as the researcher, in an interaction with informants in the research encounter and the interview situation. This is called a "discursive exchange" in *Researching Audiences* (Schrøder et al., 2003). In a discussion of how to conduct research interviews about how humans experience media products, Schrøder et al. (2003) point out how interviews activate discourses:

> In a discursive realist approach like ours, which has abandoned the notion of essential and permanent truth in social and cultural affairs, we do not see the interview as a device for digging out informants' experience, but rather as a catalyst for activating the palette of discursive repertoires available to informants, in connection with a media product. (p. 148)

Schrøder et al. (2003) add that these discursive repertoires bring forward the meanings that informants have, meanings that are constantly changing. The researcher must ensure that the changing meanings are brought forth and unfolded. The quality of the research design serves to ensure that these meanings do unfold, such as in the interview situation. Thus, validity involves questioning craftsmanship: whether the data gathering was likely to provide real insights, if we established good rapport with our informants, or whether or not the questionnaire was good enough (Ibid.).

Questioning is a process of reflection about the fieldwork design and the choices made about the methodologies; in this process, validity is dependent on the researcher's moral integrity. An important aspect is trustworthiness, and "the credibility of the researcher becomes essential" (Kvale, 1996, p. 241) for validation; the researcher must check, question, and theorize.

Validity also pertains to the reliability of humans as witnesses of their own culture. According to Kvale (1996), an interviewee can be perceived as "an informant, a subject, a witness;

or a representative, as an object of analysis" (p. 218). The reflectivity of the researcher on the selection and the quality of the relationship with interviewees is critical for the validity of qualitative research.

Ascertaining validity entails asking a series of questions. Kvale (1996) says that the questions start with *what* and *why* must be answered before posing the question *how*—in other words, "the content and purpose of an investigation precedes the method" (p. 243). In discussing the question of *if* a photograph tells *the* truth, Kvale reformulates questions of truth to be uncovered by going beyond *whether or not* the photograph is telling *the* truth—but the truth about *what*—and asking *how* the photograph tells.

Validity in this study is a question of whether the research design captures the layers of meanings as the interviewees intended those meanings. A useful approach for checking this intent is termed *communicative validity*, which Kvale (1996) defines as a communicative approach that involves testing the validity of knowledge claims in an interview or dialogue of any kind. This includes revealing and discussing differing views on a given topic between informants and discrepancies (for example, internally in the captured data). The approach also refers to the data interpretation such as generating and reflecting on differing interpretations with other researchers. This makes it possible to argue for or against an interpretation and to confront and arbitrate between interpretations (as I attempt to do, especially in the synthesis of data in Chapter 9).

5.3.2. Triangulation.

Triangulation can be defined as "the sequential execution of two or more primary studies of the same communicative phenomenon using different methods" (Schrøder et al., 2003, p. 356). This definition is based on logics and the respective strengths of using quantifiable data with qualitative data in the triangulation proper. However, in this study, triangulation is addressed within the major approach of qualitative research. Three common ways for attaining triangulation, as described by Schrøder et al., are multiple sources, or more than one form of evidence about an object (such as multiple informants); multiple investigators (such as multiple co-observers); or multiple methods (such as between or within the major qualitative approach). The first two ways are generally accepted as improving reliability, whereas multiple methods are seen as the most widespread use of the term *triangulation* in communication research. For example, triangulation can be implemented when a qualitative study uses two or three different methods (Ibid., 2003). I use multiple qualitative methods of interview, diary, and observation for data collection. Combining discursive approaches can thereby be considered as drawing on the reciprocal strengths and weak-

nesses of methodologies in order to increase the explanatory power through what can be broadly defined as triangulation.

5.3.3. Attaining a representative sample.

I briefly address the issue of how representative (how a sample "speaks" for others) my sample is for answering my research question. The point of qualitative research is not living up to sample-size requirements, as it is for quantitative research, so generalization has nothing to do with representativeness (Schrøder et al., 2003). Rather, obtaining a representative sample involves considering what fits in with the study's purpose.

Kvale (1996) mentions an example of testing a hypothesis about the different attitudes of girls and boys in regards to competing for grades, where the necessary sample was three girls and three boys; but many interview studies have 10 to 15 participants. He notes that Freud performed in-depth studies based on very few cases by obtaining significant knowledge from a few subjects that was generalizable to larger groups. The generalizability from a small sample can seem paradoxical. Kvale (1996) points out that:

> A common critique of interview studies is that the findings are not generalizable because there are too few subjects. A paradoxical answer, from the history of psychology, is that if the aim of a study is to obtain general knowledge, then focus on a few intensive case studies. (p. 102)

Considering whether a sample is representative is relevant for whether the findings from a small number of informants can apply to other individuals within a larger group, such as a country or community. Representativeness thus "hinges on the size and composition of the sample, and usually the randomness of its recruitment" (Schrøder et al., 2003, p. 23).

5.3.4. Representativeness of the sample.

In my study, I claim that representativeness involves describing why, what, and how the sample represents a general population. Below, I present the issues of *why* the students were chosen and *what* the criteria were for choosing them. Thereafter, I discuss the issue of *how* the sample relates to Danish students as a group.

I chose the students based on my interest in finding an average sample in terms of not being particularly interested in the arts or digital technologies; my group also included many females due to my interest in gender and the design of educational technology, as explained in Chapter 1. I chose students participating in the linguistic track, as opposed to the mathematical track, in this type of upper secondary (*gymnasie*) school system. The students

were in a required art class. (Note that the beginning art class is no longer an obligatory subject, and tracks altered in the 2005 school reform.) If I had chosen students in a media studies class or an advanced art class, they would have elected to take the class.

One criterion for choosing the students and the school was to find a motivated art teacher in a city school with standard media and arts equipment, as opposed to a special orientation toward art, design, media, or film. In order to find a school that fit this criterion and avoid the influence of personal connections, I contacted the educational consultant for art and design subjects in upper secondary school at the Ministry of Education. The consultant recommended several schools; I e-mailed the art, media, and design teachers at the closest school; and I received a positive reply from the art teacher, which led to my cooperation with the school (Christianshavns Gymnasium). The teacher recommended the required art class, and I found this fit best with my need for getting a mixed class, a "representative" sample.

The informants selected must be accounted for in terms of what type of "subjects" they represent and how well they represent the general population. My attempt to verify involves assessing how well the informants represent an average background, as described in statistics on educational levels in Denmark, using quantitative data. My sample matches key figures about Danish education (see figures on Web site for schools: UNI-C, 2005), however this class had one of the lowest average grades at their school. It was actually a somewhat problematic class socially and had many drop-outs. In my interview with Anna, a student, she refers to the class as a "loser class," and I return to this point in the findings and conclusions. I also verified the class according to qualitative research with student profiles by Heise on losers and winners (Illeris et al., 2002). The class consisted of 21 students of about 18 years of age, including 17 females and 4 males.

Other selections took place in regards to choosing groups to document by video and choosing the interviewees. The selection of video data took place on Day 1 of fieldwork in the classroom and was random; I had to prioritize videotaping since it was not possible to capture the activities of all five groups. I chose to videotape the two film groups (the *Outbreakers* and *Metamorphosis* groups) randomly. After the week-long filmmaking activities, I selected 10 interviewees: six females and four males. My choice was rooted in obtaining a representative sample based on how students responded to the evaluation of the film week and a questionnaire—it was not random. I was particularly interested in the members of the two film groups of which I had video data, but I wanted to get a few students from each film group to gain an understanding of how each film evolved. Not all students in the class were asked; 10 seemed to be sufficient and feasible. My criteria for the selection of 10 interviewees included getting some of the most "active" and reflective students from the

filmmaking groups, which admittedly is a bias (see Table 7.1 on students' roles and activity levels).

Nine interviews were done; eight were fully transcribed and analyzed. In this final thesis, I present five of them as the main filmmaker portraits from two film groups (the *Out-breakers* and *Metamorphosis* groups). Of the original 10 selected interviewees, one (Horses-3) completed a probe but not an interview; she dropped out, saying she was too busy. Another interviewee (Spot-1) completed the probe and the interview, but there was no video data for the group *The Spot Is Mine*, as Spot-3 did not consent to videotaping. I have only limited observations on filmmaking in the other film groups. Therefore, I narrow in on the five portraits (see Chapter 7) from interviews as they are most relevant for "triangulating" text and actions from videotaped filmmaking data. The three other completed portraits have corroborated the findings and, all in all, indicate that I reached "saturation" of data with the five interviews presented as portraits.

5.3.5. Discussion: my toolbox, validity, and triangulation.

In deciding how to approach validity, I found that since what I wanted to study were visual texts and other types of texts as well as these texts' genesis and multiple meanings, it was not sufficient to collect and analyze only the students' finished film texts. The search for ways to cover multiple sources of evidence entailed using multiple sources of data as well as multiple perspectives. The question was how to collect and how to analyze. The consideration above relates to how to ascertain validity, including posing questions such as *how* a photograph or film presents something as a truth.

A central issue is dealing with the uncovering of a truth that I find does not fit with a discourse analysis approach to doing social research. The discourse analysis methodologies that I apply focus on textual and social interactions. I stretch this toward considering semiotic processes as "indicators" of cognitive development. But there is no claim of scientific proof. Craftsmanship is used in an attempt to check, question, and reinterpret the findings and uncover the shifting meanings. The plurality of interpretive meanings is central, although this may seem paradoxical in supporting validity. Yet plural meanings indicate other potential strands of semiotic analysis, and this openness supports a "valid" understanding of the data's multiple layers of meanings. The discursive exchange contains an activation of a range of informants' discursive repertoires. In other words, the interviews may activate discourse, or "reflection." I do not believe this makes the study less valid; rather, this makes the study more relevant. For instance, the interview situation has photos that may "assist" the interviewees in "reflecting" on their own semiotic processes, discourses in mass media, and culture.

The study's validity hinges on whether each part of the various methodologies is suitable for exposing the discourse in the particular data type. Iconography was useful for my case study because it was suitable for treating the film texts that draw on art historical sources (such as Greek vases) and for my analytic foci on the resemiotization of images, the genesis of ideas in the film groups, and the images' meanings.

Due to the fact that my research question involves different types of units (agents, interaction, and text) it was necessary to address this combination of units. I attempt to create appropriate methodological intersections to treat data and capture external sign-making. The experience unit of analysis relates to the agents' internal sign-making and is difficult to capture empirically since it goes on internally in other humans and happens over time. This internal sign-making is approached as if there are "indicators" in the external discourse, but there are many gaps in this theoretically in terms of claiming that the external is internal, as discussed earlier.

A discourse approach provides not one truthful answer but rather an interpretation of particular discursive events that point to further questions of social action. It makes generalization a problematic notion and inapplicable in the sense of reproducibility. However, discourses and actions involve particular agents and I do find it important to address how representative the sample in this study is in terms of prior experience, as this is an important issue for the examination of learning. Thus, it is relevant to discuss prior expertise and attitude. Are the students super-users of technology or shy of it? Are they amateurs or semiprofessional artists? In order to clarify the selection, I have classified all the students in Table 7.1, *Roles and Activity Levels in Film Process*, in the introduction to the data of portraits and the film groups' "interaction order."

5.4. Ethical Issues: Permissions and Anonymity

Finally, I present the ethical decisions. Ethical and moral questions, including considerations of consent and anonymity protection, pertain to every stage of the research study, from the beginning through the reporting of results. As Kvale discusses (1996), an enterprise such as an interview inquiry is a moral enterprise where the personal interaction in the interview (between the interviewer and interviewee) and the knowledge produced affects our understanding of the "human situation." Kvale (1996) considers the following ethical issues pertinent in different research stages (p. 111):

- Purpose (what does the study offer to improve the human situation)
- Design (obtaining informed consent, maintaining confidentiality, and considering consequences for informants)

- Interview situation (not stressing informants)
- Transcription (protecting informants and being loyal to their intent)
- Analysis (being critical toward interpretation and whether informants should have a say in interpretation)
- Verification (the ethical responsibility of the researcher to report knowledge that is as secure and verifiable as possible)
- Reporting (protecting confidentiality and avoiding consequences for informants)

According to Kvale, questioning the ethics and the researcher's role ensures scientific quality. Below, I consider four ethical issues that are most pertinent to this study: informed consent, using videotaping, having the freedom to participate, and confidentiality (including the use of pseudonyms). The benefits are considered in the discussion.

5.4.1. Informed consent.

All of the students signed consent forms. Although one student refused to be videotaped, she consented to participate otherwise. Informed consent was obtained by first providing information about the research project to the art teacher, who then asked the class early in 2005 if they wanted to participate in the study in the fall of 2005. After their interest was established, I met with the class and informed them of the study's research purpose and design. When the study began, the participants were given further information and asked to sign permission forms giving me their consent to conduct the study, to film in the school, and to allow the film texts to be shown on the DR Web site, www.dr.dk. It was made explicit that they could refuse participation and that I would show the videotapes for research purposes only.

5.4.2. Using videotaping in the school.

I find that videotaping can be invasive and presents ethical and practical dilemmas, yet it is a valuable way to collect data for this type of analysis of designing. After looking through all the videotapes and reflecting on videotaping as a practice, I now see the students and myself as performing "roles," in Goffman's sense, for the video camera. The students are at times reacting from a position of showing defiance. Morally, videotaping in a school presents dilemmas because it is invasive; for example, the students reacted to being "on camera" by performing pranks and exhibiting acts of defiance at being "stalked," as they put it. I see the students as negotiating how far they allow me (as an outsider and an authority person) to dialogue with them; they set limits for participation. One limit they set was

videotaping activities during breaks. However, this limit was addressed and changed during the week; school breaks dissolved once the film groups were in the production phase, and the students apparently got used to videotaping (discussed again briefly in the critique in Chapter 10).

5.4.3. The freedom to participate.

Participation is an issue in terms of how obligatory it is. In the fieldwork, I selected 10 students as interviewees, which split up the art class into those who proceeded with the usual art activities and those who met with me about the cultural probes (journals and photos) during art class time (see Chapter 6). Everyone was free to refuse or drop out and join the regular art class if they wished. Most students reported spending time and effort on the cultural probe. The question is why. The main reason seems to be that participation was embedded within the art class and did not impact students' grades. The only reimbursement for their time was drawing materials and DVDs with their photos. All 21 students were invited to see an animated film at a movie theater and received DVDs containing all five animated films. In hindsight, I could have offered a small sum of money to the interviewees for the time they spent beyond class time. However, reimbursement would have marked the interview as an extracurricular task. Alternatively, the probe and the interviews could have been better integrated with the art class.

5.4.4. Protecting anonymity: using pseudonyms.

My ethical considerations include protecting anonymity to the extent that is appropriate. An appropriate level of confidentiality in the study was maintained. In some cases, the students wrote their full names on their films, which was their own decision. The school name is used in the thesis because it does not reveal identities. Otherwise, I obscure the participants' identities; for example, the photos in the thesis do not show students' faces clearly, even though I have permission to publish the photos. The videotapes cannot be similarly adjusted; therefore, they appear only in the full appendix for the committee. I did not interview students about personal issues, but issues of drug abuse, emotional turmoil, and hacking were introduced by the students. I do not want to compromise the privacy of the students in any way.

In order to disguise the students' identities, I use pseudonyms. Only interviewees are given pseudonyms that are first names, and these are arranged in alphabetical order. The numbering system loosely indicates leadership, where a number one is a leader. For example, Anna is a first name pseudonym, she is a leader in the *Metamorphosis* film group and therefore is also Meta-1, see the list below. The ranking is not strict because leadership qualities,

roles, and tasks varied. Students who were not interviewed do not have first names but have only film group names and numbers, such as Meta-4 for the fourth member of the *Metamorphosis* film group.

The names of the film groups and students in this thesis are changed to the following:

- *Metamorphosis* (*Metamorfose*) has four group members: three females / one male. Three interviewees: A. Anna (Meta-1), B. Ben (Meta-2), C. Celia (Meta-3). One not interviewed: Meta-4.
- *The Out-breakers* (*Udbryderne*), abbreviated as *Out-breakers*, has four group members: three females / one male. Two interviewees: D. Dea (Out-1), E. Emil (Out-2). Two not interviewed: Out-3, 4.
- *Equal Horses Play Best* (*Lige heste leger bedst*), abbreviated *Horses*, has five group members: four females / one male. Two interviewees: F. Frede (Horses-1), G. Gina (Horses-2). Three not interviewed: Horses-3, 4, 5.
- *The Onion Man Returns III: Getting There Is Very Important* (*Løgmanden vender tilbage III: Getting There Is Very Important*), (the original title mixes Danish and English) abbreviated *Onion Man*, has five group members: four females / one male. One interviewee: H. Henrik (Onion Man-1). Four not interviewed: Onion Man-2, 3, 4, 5.
- *The Spot Is Mine* (*Pletten er min*), abbreviated *Spot*, has three group members: all female. One interviewee, not used. The members are called Spot-1, 2, 3.
- The naming of the teachers and observers are as follows:
- The regular art class teacher is *the art teacher*.
- The guest teacher from The Animation Workshop is *the animation teacher*.
- The information technology (named IT after the school subject) teachers who helped set up computers are *IT Teacher-1 or -2*.
- The observers include a staff member from DR, who helped with sound editing and is referred to as *DR Observer 1*. A second observer is a PhD student assisting with videotaping and is referred to as *Observer 2*.

5.4.5. Discussion of ethical issues.

The ethics of research include considering the purpose and whether it can provide beneficial consequences for informants as well as avoid negative consequences. I consider one improvement to be the opportunity for the students to learn about themselves and about

filmmaking by participating in the study, an idea that was corroborated by the art teacher and the school principal. The school staff remarked that the class in fact seemed to get "a boost," perhaps related to the special attention from researchers and DR. The rather low status as a "loser class" and the idea of a "boost" are discussed in the conclusions. The introduction of animation would otherwise not be possible for these students, the art teacher, or the school (see the discussion of teaching in the school in Chapters 6 and 9). The students expressed interest in publishing their film texts, such as on the DR Web site, and agreed to this from the start.

6. Methods for Data Collection and Analysis

Chapter 6 describes how the data were obtained and the particular tools I used as analytic methods. This chapter poses specific methodological issues regarding the construction of the case study. Chapter 6 has three topics: planning the fieldwork, methods for collecting the data, and conducting the analysis. The presentation about collecting describes the various methods used in the fieldwork, such as the videotaping, the cultural probes, and the interviews. The presentation about data analysis includes the methods for selecting and handling data. The presentation of conducting data analysis discusses the two focal points of composition and resemiotization in relation to design as a semiotic process. The chapter explains the methods from social semiotics, MDA, and visual semiotics and iconography that are operational for my data analysis purposes. My terms and procedures for categorizing data are presented. The chapter ends with showing and discussing the tables used for coding, generating interpretations, and framing levels of meanings in films.

6.1. Planning the Fieldwork

This summary is meant to provide a brief background on the project planning. It started in early 2005 and involved technical and logistical preparations. The fieldwork involved extensive project planning in 2004–2005, including establishing a partnership for the PhD project with DR and the two teachers and their institutions.

6.1.1. Planning the filmmaking week.

A review of the planning is presented here in order to clarify the context for the case study and the premises for the data collection. I planned the week-long animation filmmaking instruction was planned in collaboration with the art teacher and the animation teacher. The animation teacher comes from the Center for Animation Pedagogics at the Animation Workshop in Viborg, Denmark, a professional animation school that is part of VIA University College. She is experienced with establishing animation production workshops for children and youth (The Animation Workshop Web site, 2007). The filmmaking instruction in this case was planned to span five full school days (Tuesday through Monday), which entailed rescheduling other school subjects.

The phases of film production in the classroom were planned as three phases. In practice, the phases overlap and are messy, but they are roughly as follows:

- Pre-production phase (on Days 1 and 2), when the class made film synopsis, storyboards, and prepared objects.
- Production phase (on Days 3 and 4), when the class shot the frames and recorded sound.
- Post-production (on Days 4 and 5, but extending after the week), when the class transferred files between software programs and edited audio and visuals together.

6.1.2. The filmmaking instruction, location, and resources.

The planning details provided here are relevant in order to illustrate the practical aspects and discuss how the fieldwork interfered with the school's usual practices, and it is interesting to consider as a disruption of discourses in place. The animation filmmaking in the art class spanned three classrooms, two art rooms, and half of one of two IT rooms (for teaching about IT). The discourse as seen in the rooms' layout is interesting. The two art rooms and neighboring two IT rooms display different pedagogical discourses about how and what the students should learn and do. One art room and both IT rooms had a "panopticon" (a term from Foucault) setup, meaning the teacher was able to see everything when lecturing to the students, who sit at desks in rows facing the chalkboard at the front of the room. In contrast, the other art room was an atelier with visual art displays and movable painting easels, paint-stained large tables, and chairs.

The preparation for the animation course involved coordinating schedules, location, and IT equipment installation. Gathering equipment was done collaboratively by the art teacher, the animation teacher, and me. I arranged for the Stop Motion Pro producers to donate the use of the animation software program (Stop Motion Pro Web site, 2007). The animation workstations necessitated extra equipment and materials (Figure 6.1). Half of an IT room was set up for the animation film groups' activities so that each film group had a workstation with table space for setting up physical animation and a camera on a tripod connected to a PC. I coordinated the setup with two IT teachers from the school (*gymnasium*) and an IT staff member from my university.

Figure 6.1. Workstation for animation, including: tripods, camera (pointing downward), FireWire cable, and PC. The tabletop is the work space for shooting objects placed under the camera.

In summary, this introduction provides some background on the planning and how the study was introduced in the school context. My overall evaluation of preparations is that many technical problems hampered planning. For example, a lack of demonstration of the software program by the animation teacher had implications for the learning experience of the art teacher and students. (The pedagogical issues are discussed further at the end of Chapter 9.)

6.2. Methods for Collecting Data

In the following section is a discussion of my various methods for collecting data, which I have organized around the three components of data: films, filmmaking, and filmmakers.

6.2.1. Films: collecting the five short animated film texts.

Five short animated films (each about one minute long) were collected in the classroom on DVD. They were formatted after the week-long instruction by the art teacher and IT staff. Unfortunately, the films were saved only in Windows Media Player format in a low resolution (a technical mistake at the school). The films have a long trail of sound because they were not cut at the end. I collected storyboards after filmmaking was complete.

6.2.2. Filmmaking: collecting the video data.

All five days of filmmaking activities, about five hours a day, were videotaped, with a primary focus on two film groups. On Day 3, two video cameras recorded simultaneously, used by me and Observer 2. Photos were taken by DR Observer 1. I kept a video journal in order to review each day in the field, a method of recording a mutual interview. Video journaling was done between me and an observer or me and a teacher at the end of each day in the field. During a video journal with the art teacher on Day 4, the school principal

joined us for five minutes because he dropped by after a student had talked excitedly about making the animated films. The video journals served to recall the flow of filmmaking activities during each school day and to compare observations. As discussed in Chapter 5, videotaping entails practical and ethical considerations.

6.2.3. Filmmakers: collecting the materials and conducting the interviews.

Below is a review of the different materials in the data and collection methods. Note that the cultural probes (journals and photos) as well as questionnaires, storyboards, and film synopses were brought in and discussed in the photo-elicitation interviews.

The cultural probe materials I handed out to students included a hardcover blank journal, blank postcards with questions, colored markers and pencils, a tourist map of Copenhagen, and a single-use camera. On the journal's first page was a list of suggested photo subjects. I attempted to make the journal look like a sketchbook in order to motivate students to write and draw in it. The students were asked to complete the probe during the week and return their journal and camera to me. I read the journals and processed the negatives to prints prior to the interview.

The interviewees also filled out a longer questionnaire based on questions in a survey by Drotner on media consumption from *Media for the Future* (my translation) (2001). The questions address family background, interests, level of experience, and preferences for mass media and the creative arts. All 21 students in the class had filled out an abbreviated version of the longer questionnaire and an evaluation of the filmmaking course.

In total, I incorporated the following interview materials into the interviews:

- The student's evaluation of the filmmaking course
- The two questionnaires filled out by the student
- The film storyboard and synopsis of the film made in the student's group
- The finished film
- The cultural probe consisting of written and visual texts
- The photos taken by the student for the probe

The interviews were semistructured and included questions that progressed from questions about their everyday lives and use of various forms of media, to questions concerning the filmmaking process in the class as a learning experience. I posed particular questions to each student based on his or her materials, but the interviews followed the same guide. The

interview guide progressed from an introduction to the purpose and structure of the interview. The first set of questions concerned the student's work process with the cultural probe. Questions included: What was it like to take the photos? When did you do it? How much time did it take? Did you select certain parts or get stuck somewhere? I reviewed all the cultural probe materials and referred to the original instructions for the probe. The questions in the interview addressed whether or not the student had followed these topics for taking the photos. Subsequent questions concerned the student's experiences with arts and media use both in and out of school. At the end of each interview, I asked the student to reflect on the working process during the animated film instruction week, and I discussed the film synopsis, storyboard, and evaluation. All interviews were recorded in MP3 format for audio and videotaped as backup. The dialogue was transcribed in full (see full appendix).

6.3. Methods for Analyzing Data

Below is a review of my specific methods for analyzing the different data components. I follow the sequence of the three chapters on data: Chapter 7 on the filmmakers and their groups, Chapter 8 on the filmmaking processes, and Chapter 9 on the films.

6.3.1. Analysis of experience: the filmmaker portraits.

My analytic tools for portraits in Chapter 7 attempt to look at experience in the students' own discourses about their prior experience (with the arts, media, film in general, and the week-long animation course in particular) as well as their visual texts (their cultural probe materials and the animation texts made in the film workshops). I review below how I condensed the interviews and distilled the photos, or what is commonly termed coding the data.

The analysis involved a process of "distilling," during which I made charts of the symbolic meanings, which I see as having various levels of meaning based on the Panofskian approach used by van Leeuwen (2001). In order to analyze the students' interviews and visual texts discussed in the interviews, I applied methods for distilling and organizing the images into more manageable thematic groups. I was experimenting with interpreting the collated meanings between the spoken dialogue and the visuals in the photo-elicitation interviews, including how to integrate or connect the photos and associated meanings with broader questions related to the student's prior experience and discourses: what he or she knows, values, and considers as art, film, and media.

The opportunity for dialoging with students about the whole set of texts made in the research project (the finished film texts, film synopsis, film storyboards, and the photos from the probes) provided me with greater background information, or context, for understanding the film text. It also helped me identify specifically where they found inspiration for their films; for example, the *Out-breakers* film group had talked about the style of the animated short films *Soup Opera* (Barrier & Clémençon, 1991, 2000) when designing their film. The student Dea referred to *Soup Opera* in her interview.

As mentioned, I had a great deal of data and I had to select a few texts and excerpts for presentation in the thesis. I worked with the photos by categorizing them in a variety of ways. I experimented with visual methods for content analysis and image style and composition analysis, as described in other studies (Bell & Milic, 2002; Kress, 2005; McDonagh et al., 2005; Prior, 2005). It was helpful to present my content analysis to peers to get their responses on content and method. I showed the photos from my case study to Nancy van House at UC Berkeley and discussed the benefits of addressing subject matter. Van House has worked out a set of categories for the social uses of personal photos and names the categories as follows: Creating and Maintaining Social Relationships, Constructing Personal and Group Memory, Self-Expression, Self-Presentation, Functional Communication with Self and Others (2007). The photos that van House analyzed resemble the photos taken by my informants, albeit her data are photos from mobile camera phones while my informants had single-use cameras. I adapt some of her categories to my photos.

The process of condensing and distilling refers to working from the ground up, thematically arranging the students' photos and the written interview transcriptions. In order to distill and condense the themes that cut across the eight interviews, I chose the main topics from my interview guide and pulled out overall information and specific quotes and remarks from the interviews. This process helped me generate a three-page analytic overview and ensure consistency. I tried various types of charts and layout formats on the computer (using, for example, Microsoft Excel) for the photos. I found that printing the charts and photos on paper and sorting them physically afforded me a better overview. I then cut out and moved the photos around and wrote key words on Post-it notes as I attempted to categorize photos and meanings.

The condensation of each interview was based on the following central interview questions and topics:

- Inter-textuality: other images, books, films, or artists referred to during the interview or in the journal
- What was it like to take the photos?

- Postcard: what does art mean to you?
- Experience with making pictures
- Creating or producing symbolic expression—interest and motivation
- Using a computer and digital technology
- Use of mass media
- Animating the film in school (and expertise or roles in the film group)
- Cultural probe diary themes—a central image and text
- Questionnaire data

I opted to group some photos that were similar (especially groups, such as parties) by choosing just one photo from the student groups, both to reduce complexity and to weed out photos that depicted people who were identifiable.

Three thematic categories emerged from the condensed photo-elicitation interviews:

- Markers of history: indexes, signs, and symbols relating to time
- Self-presentation: showing and representing the self
- Construction of personal and group memory: parties, family, and friends

Distillation was done by attempting to collate thematic meanings from students' photos and interviews, going from the level of description, to meanings to students, o my analysis—and then back down again. In a nuts and bolts sort of way, I arranged the photos in charts, filled in descriptive words, and then arranged photos and words in thematic groups. I cut across individual student photos and various themes to explore what seem to be key words or meanings. This exploration allowed me to pull out key words, use a poetic approach for finding the symbolic meanings, and distill the photos and the discussion of the photos into words contextualized by other background information from the interview. Photos placed under *self-presentation* and *construction of personal and group memory* often overlapped, as images of others seemed closely related to self. Yet, for the sake of managing data, it was helpful to keep images of others in a separate category. I defined others as anyone other than the photographer and the objects that related to remembering personal bonds, group membership, or communities.

I used three levels of interpretation for the students' photos in the charts: description, meanings to student, and my analysis. The three levels correspond to the three levels of "iconological interpretation" based on Panofsky's three levels: representational meaning,

iconographical symbolism, and iconological symbolism. The following is my working combination of levels of interpretation used in the charts:

- *Representational meaning* (description) was used to describe what is apparent as the photos' natural subject matter, such as an image of a wooden guitar.
- *Iconographical symbolism* (meanings to student) is applied to show and interpret the conventional meanings, such as what the student herself ascribes to "wooden guitar."
- *Iconological symbolism* (my analysis of meanings) is an interpretation of what I as an iconographer find concerning ideational or symbolic content, a shift away from what the student (who took the photograph) might be aware of or consciously intended.

In the analysis of data for the filmmaker portraits, I gave special attention to the move from the second to the third level (from iconographical symbolism to iconological symbolism). As mentioned, the methodical approach in iconography entails doing "intertextual comparison and archival background research" (van Leeuwen, 2001, p. 117) in order to explore the symbolic meanings of the people, places, and things depicted. However, I chose to trace just a few trajectories in regards to the visual texts in a modified approach.

6.3.2. Analysis of filmmaking: designing and reflecting as interactions.

As reviewed in Chapter 5, MDA was applied especially to the filmmaking data in Chapter 8. I continue here with presenting MDA in terms of how I chose the video data sequences that became my "windows" into filmmaking. My method for finding and choosing the specific windows of real-time events was to first gain an overview of the classroom activities, and then find key video sequences for micro-analysis.

I started by viewing *all* the video sequences and roughly transcribing actions and speech and then choosing areas that were relevant to my research question. Actions are often submerged into practice by habit or invisible because they are so integrated in practice. Scollon advises to start by questioning what "actions or practices (or objects or built structures) are being foregrounded" (R. Scollon & S.W. Scollon, 2004, p. 164) and what are backgrounded. A method for identifying actions is to "clean" unwanted "background discourses" and select from what's left (p. 163). One of the pitfalls of MDA is to get too open or too narrow—to "continue opening up the circumference of the analysis [or become] obsessively narrowed to single moments, speech acts or events, or participants without seeing how these connect to other moments, acts, events and participants which make

up the full nexus" (R. Scollon & S.W. Scollon, 2004, p. 9). As MDA assists in studying interaction in the here and now, but not in the development of sign-making over time, I wanted windows occurring at different times to show "progression" during the week.

In the analysis of filmmaking actions, a prime concern was to find a method for selecting essential pieces of data that served the investigation of the research problem. I used the idea of action making a circumference around main aspects that could address my research question. Although designing and reflecting are intertwined double processes, different parts of the dynamic processes are indicated in the selected data windows.

Designing is indicated in Window 1 on the storyboard in the pre-production phase, and in Window 2 about the process of learning to use software (onion skinning function) in the production phase (terms are explained below).

Reflecting is indicated in Window 3 with the discourses centering on films in process. The classroom critique session in the post-production phase seemed central to the investigation, as it offered a "pedagogically framed" reflection. However, this necessitated using a longer chunk of video to contextualize the critique session presentation, where students discuss intentions at the end of production and refer to the storyboard plan and the incomplete film (see full appendix).

A brief explanation of storyboard and onion skinning follows. A film storyboard, a part of professional film practice, involves preparing a film or making a "blueprint" (Kress & van Leeuwen, 2003). It can also be seen as "juxtaposed pictorial and other images in a deliberate sequence, intended to convey information and/or to produce an aesthetic response," a definition of comics that I find useful for storyboards, based on the comic artist Scott McCloud (1994, p. 20). A similar comparison to comics is used by the animation teacher when introducing the concept of a storyboard to the class.

Onion skinning is a software feature that visualizes how the single frames (or single units of still images) look when animated (referring to onion layers). In the technique of stop-motion animation, the single unit serves as a building block of the moving images. The onion skinning function allows the single, still frame to be visualized by an animator as if in motion with the next frames (for instance, a figure may appear to lift a leg for running).

My analytic choice of storyboarding was based on how it analytically bridges the compositional relationship of the whole to the single frame of a film. I can also analyze frame-by-frame adjustments by studying onion skinning. The third "window" from a critique session helps expose the reflection on intention in their composition of text.

6.3.3. Analysis of film: resemiotization *and* composition*.*

This section explains the specific methods for analyzing aspects of resemiotization and composition and introduces the various tables and graphs on film levels used to analyze composition.

Resemiotization is used to grasp both text and action. As mentioned, I adapt Iedema's term (2003) and apply it in two ways:

1. Interpreting *how* signs and symbols alter across modes, or transduction (Kress, 2003).

2. Asking *why* these particular semiotic sources are selected and impact on design.

My method includes gathering background information on how the films refer to and alter texts from a variety of sources—in this case, myths, TV series, children's programs, and other films. The changes in meanings result from transmuting or transforming, which opens up new and multiple layers of meanings (Kress, 2003). The analysis refers to tracking selected sources of ideas and transformations occurring in a few instances in order to show how the film texts achieve multiple interpretations; they mix, weave, and transform meanings, using multiple levels of ambiguity in their design. This transformation is captured by analyzing how the students rework heterogeneous designs as sources, such as in applying the spatial, circular quality of a Greek vase to the spatial and temporal composition of a film text. The particular images and narratives refer to the viewer's knowledge of sign conventions, such as a frieze on a round Greek vase.

The term *composition* refers mainly to how audio/visual texts use semiotic resources and codes as an ensemble. Kress and van Leeuwen's *Reading Images* (2006) details how composition occurs through three interrelated systems:

- Information value (the placement of elements)
- Salience (the elements composed so as to attract attention to varying degrees)
- Framing (the presence or absence of structuring devices)

As mentioned previously, the moving images (versus still images) use different methods of integration (or codes) for spatial and temporal composition. It was necessary to build elements of analysis that enabled me to pin down differences between still and moving image texts. This process involves analyzing how the spatial and temporal elements combine and integrate in a multimodal text or bring the various elements together. Moving images bring together "ideational and interpersonal elements…bits of representation…into a coherent whole, the kind of whole we call 'text' or 'communicative episode'... [This is] realized through composition, in space as well as time" (van Leeuwen, 1996, p. 94).

My analysis of text composition refers largely to the structuring (or framing) of the film levels and refers to the particular compositional devices that make up the spatial and temporal structures. I use the idea of film levels to relate the whole work to the single frame (the single image of the film) to study the meanings made in the finished film texts. The film levels are planned on a film storyboard, which realizes composition and aids in semiotic acts. I focus on how the storyboard serves as a planning resource by examining how the students use various sign systems (numbers, position, sequences) in order to formulate an intent and plan for the representation of time, space, and rhythm in a film. Thus, the storyboard functions as a starting point for the ideation of the film and as a type of blueprint for composing the single image and moving image units. The film storyboards resemble comics and portray narrative conventions that the students may know and resemiotize from actual comics and graphic novels. Onion skinning is, in essence, a similar concept for examining the actions of composition in its function for conveying motion at the film's smallest level.

In order to ascertain the aspects of composition and resemiotization and handle data, I have leveraged various tables and graphs for film analysis, as described below. Hull and Nelson describe how the analytic task entails describing the formal qualities in order to clarify the use of multiple modes in relation to one another and clarify the density and complexity of film texts, such as by using tables (Hull & Nelson, 2005; Nelson, 2006). My method for film analysis includes using tables in order to display the films' structural levels. I have grafted my analytic framework onto other researchers' strategies for multimodal film text analysis. My tables for analyzing the films' composition refer to Hull and Nelson (2005) and are based on Iedema's (2001) tables "Six Levels of Tele-film Analysis" (p. 189) and "Summarizing the Analysis" (p. 197). The tables below are my templates or working tools for analyzing the animated film texts in Chapter 9.

Analyzing the multimodality of the film text composition is central to conducting a formal analysis; it identifies how the multiple modalities realize intent through visual, writing, audio, and other means. Modes can be broken down further—for example, audio can be speech, music, or song. Table 6.1 below provides an overview of the multimodal analysis of film and the various semiotic resources available when modes combine.

Table 6.1

Multimodality of Film Text (Template), Adapted from Iedema

Multimodality of film text	
Modality	**Description of modes**
Visual: still image	Composition of frames of film as single image. The design of image as a film set and use of space, colors and materiality.
Visual: moving	How compositional elements relate to each other in time and use of space. Relationship between subjects in film text and to viewer- distance to lose-up or other shift initiated by camera or subject position.
Sound: ambient or voice	The background sounds may be ambient (from surrounding area) or seem specifically related to a figure whether or not synchronized with visuals.
Sound: music	Musical score melodies that may or may not be recognizable.
Words and numbers	Written systems of semiotics signification using alphabet or numbers. May include other symbols or icons that belong to the grammar or signs of the language system.
Multimodal	Rhythm and timing of the whole work created by interrelating modes as a sum total, determined by how and which modes are used to represent what in the film text as a whole. Differentiation of how sound vs. visual functions to represent the meanings.

Table 6.2 below is applied to the analysis of film levels and is very similar to Iedema's "Six Levels of Tele-Film Analysis" (2001), but here it focuses on animated film. Note that the levels in Table 6.2 are numbered to indicate a hierarchy, where *1. Still image* is the smallest unit or level and appears at the top. See the further explanation of the six levels of film structure below the table.

Table 6.2

Levels in an Animated Film Text (Template), Adapted from Iedema

Analytic framework of levels in an animation film text	
Level	**Description of the level**
1 Still image	The single frame that moves or animates when assembled as an animation film. It takes 24 frames to make 1 second of animated film.
2 Shot	A shot is segment that in animation refers simply to one uninterrupted viewpoint. Shot refers to `uncut footage´ in live action film.
3 Scene	A scene remains in 1 time-space. It can include shots such as a close-up or has shifts initiated by camera or subject position.
4 Sequence	A sequences is usually made up of several scenes. Can follow a specific character or topic across multiple time-spaces.
5 Generic stage	There are typically 3 stages in a film: beginning, middle, end. Stages serve to frame phases in a conflict and narrative.
6 Whole to narrative	The whole work is in relation to the type of narrative and its particular stylistic conventions: fiction (including animation art), factual.

Level 1: Still image. It takes 24 single frames to make one second of film, but a single frame of the animation may repeat. The eye can only perceive down to about one sixth of a second, so a frame can be repeated about four times. (Therefore, the animation teacher recommended shooting the same single frame three to four times in the classroom instruction.)

Level 2: Shot. A shot in an animated film has different (perceived) points of view in a scene, which depends on "the degree of temporal and spatial continuity or discontinuity we perceive to link the shots" (Iedema, 2001, p. 189). A shot is an inserted point of view or instance, such as an over-the-shoulder shot or frontal shot of a character. However, a "shot" usually means the continuous footage or "uncut camera actions" (Ibid., p. 188) in a live action film—not the same as producing animation with single frames. Yet an animated film uses the *illusion* of the camera, so the level of the shot is applicable.

Level 3: Scene. The defining quality of the scene is continuity of time and space so that the scene is read as being in the same moment in time and as an action carried through in one concrete space, according to Iedema. For instance, the *Metamorphosis* film represents "chases;" each chase is one scene because the chases occur in different physical settings as indicated by the different buildings in the background. Scenes can be made up of shots of different people or objects participating within the structure of the scene, such as close-ups and reaction shots in scenes as in *Metamorphosis*.

Level 4: Sequence. Sequences are comprised of contiguous scenes that are linked not because of the time and space continuity, but because the scenes form a logical or thematic unity. For instance, the coherence in the chase scenes occurs because the repeated chase scenes in the *Metamorphosis* group's film form one thematic sequence. This sequence employs notable variations in the background buildings. These variations are apparent because the sequence signifies a repeating pattern of chases, which uses modifications. This serves to drive the narrative.

Level 5: Generic stage. All of the animated films in the case study have stages reminiscent of the classic conflict-driven, three-act model with the dramatic climax in the middle; "roughly, stages are beginnings, middles and endings; each genre has a specific set of stages: narratives tend to have an orientation, a complication, a resolution" (Iedema, 2001, p. 189). The classic three-act model uses narrative and twists where relationships go wrong and are later resolved. Stage boundaries are signals (devices) for representing changes from one stage to another.

Level 6: Whole to narrative. Stages structure a film as a whole. They can be distinguished by how sequences realize their type (style or genre) of film (van Leeuwen, 1985, 2005).

The final table, Table 6.3 below, displays the summary of the film text analysis in terms of the interrelation of the metafunctions (Iedema, 2001, p. 197). An overriding analytic focus is how the student filmmakers select one semiotic resource or meaning potential over another (Jewitt, 2003). The finished film text indicates the students' intended meanings, but the result may, arguably, more or less match the semiotic intentions of the filmmaker. Herein, I return to Halliday's idea that the metafunctions of any communication simultaneously fulfill a social process. The metafunctions are seen as appearing simultaneously, but the different functions are backgrounded or foregrounded or have different analytic weight.

Table 6.3

Summary of Analysis of a Film Text, Adapted from Iedema

Summarizing analysis: Metafunctions in relation to film text levels

	Single frame	**Scenes and sequences**	**Stages to text as a whole**
Representation: *What is the film text about?*	How vectors used: dynamic relations or unconnected.	Who / what themes represented and how temporally organized.	What themes carry text and how whole form unfolds and ends.
Orientation: *How does the film text enact interpersonal aspect?*	Direction of gaze, movements, distance between subjects.	Who / what enacts and how socially organized in subject relations.	How elements are interpersonally positioned in relation to each other as a whole.
Organization: *How is the film text put together?*	Design elements: color, style, form, intertextual.	How are sequences organized temporally.	How text (themes + meanings) becomes a sum total.

Table 6.3 is used for the summaries of film analysis in Chapter 9 with the purpose of bringing together the overriding communication. It is also used for framing the analytic comparison of the two primary student films. See Chapter 3 on metafunctions in social semiotics.

The *representational* or *ideational* concerns how the students represent some aspect of the world through their animated film text. Ideational resources are concerned with construing experiences with people and things and their activities. Asking who is doing *what* and to *whom*, *where*, *when*, *why*, and *how* is relevant for understanding the logics and networks of interrelationships. Ideation is thus about how *experience* is construed and relies on a person's past. This refers also to the MDA area experience.

The *interpersonal* is about the negotiation of social relations: how people interact, including the feelings they try out and share. This aspect denotes orientational relations between the represented and interactive participants (audience), that is, the relationship between the producer of a sign and the receiver, or reproducer, of that sign. The interpersonal refers also to the MDA area termed *social interaction*.

The *constructional* function concerns how *textual* resources organize information flow: the ways interpersonal meanings are distributed and the use of modalities (action, image, music, and so forth) for coherence. It refers to the way the other two functions are realized. The constructional aligns somewhat with the concepts of the MDA area termed *discourses in place*.

In particular, the constructional function is important for grasping filmmakers' intentions, and whether they are hindered in integrating ideational or interpersonal elements to compose their narratives as films. These intentions may not have been realized in their representations, for one reason or another; this is important to identify and analyze. Perhaps it was not possible to create the coherent whole they envisioned, and thus the film text is not what the filmmaker intended. Capturing their semiotic changes along the way reveals how the filmmakers resolved their intentions for representing their ideas given the hindrances they encountered while making their film texts. The two analytic aspects of composition and resemiotization assist in capturing how the students design—that is, how they make semiotic *choices* and invent language.

6.3.4. Summary: combining methods for analysis.

As I argue in Chapter 5, I find it helpful to apply MDA to my video data to capture the here and now of "designing and reflecting" during filmmaking production. Theoretically and methodologically, I combine the social semiotics approach based on the notions of the metafunctions of language with the related approach from MDA. Inspiration for the methods are the overlaps of Iedema with Ron and Suzie Wong Scollon, as well as the cross references in *Discourses in Place* (R. Scollon & S.W. Scollon, 2003), *Reading Images* (Kress & Van Leeuwen, 2006), and *Discourse and Technology: Multimodal Discourse Analysis* (LeVine & Scollon, 2004). Further critique of my methods and methodology appears in Chapter 10, followed by a discussion of the contributions of my methodological toolbox in Chapter 11.

7. Filmmakers: Analysis of Experience

This chapter presents portraits of experience of the five student filmmakers from the two primary film groups, *Metamorphosis* and *Out-breakers*, as well as a discussion of the roles in the film group and their interaction order. The chapter closes with a synthesis of the analytic themes from the portraits.

The optic applied to the portraits is that the students are "taking" certain roles in their film group's interaction order, roles that are also embedded in their interactions within the school culture. Methodologically, I approach the film group roles as simulated film teams that relate to theories about negotiating positions in their everyday lives, with reference to Goffman's concepts of roles, also adapted into MDA. The idea of positions is related here to roles within a professional film team and also refers to Danish educational researcher Heise's idea of winners and losers in school, reviewed previously. The data are analyzed according to how the students search for symbolic representation, which is seen as metaphorically related to their embodied "self" and how they get or take roles.

The portraits explore the discourse of the participating students in relation to designing referring to the concept of reinventing language (Kress, 2007) and their references to prior experience. I aim to gain insights into my main research question regarding how they are designing and reflecting on transforming texts. The portraits pay attention to both the animated films and the group filmmaking processes, as well as the students' background in "designing"—that is, expertise or prior talent. My goal is also to understand the individual filmmakers' intentions and discourses about their semiotic processes, seen as possibly developing through the interview itself as part of an ongoing dialogic reflection (Wegerif, 2008). In the synthesis of portraits at the end of this chapter, I discuss the data in relation to creative and cultural perspectives, referring to work by Burn, Parker, and Drotner on filmmaking by young people, and, more generally, work by Willis and Bruner. The roles and film group interaction order is seen as influencing the filmmaking and films, which are analyzed in the following chapters. My aim is to introduce the individual filmmakers here so that the filmmaking data in Chapter 8 become clearer to the reader in terms of *who* is speaking, editing, and so forth. In Chapter 9, I return to synthesizing data, including discussing the students' roles in the groups.

7.1. Portraits of Filmmakers

The portraits are based on a compilation of the visual and written texts of the cultural probes and interview dialogues. The probe photos were categorized with a content analysis

approach using themes, including self, others, and history (as reviewed in Chapter 6). I have captured the essence of the content of each portrait with one keyword (marked in bold), which pinpoints the fundamental themes in each student's discourse about designing and reflecting on the personal relevance of arts, mass media, or film. The keywords from the portraits are: *energy*, *power*, *tingled*, *interpret*, and *grabs (me)*. I present only one visual text from each student—a photo taken from the students' sets of photos. The only exception is Anna, for whom I use a drawing from her probe journal.

I want to point out that due to my expanded idea of *text* and wide interest in mass media, film and literature, I asked broad questions on the students' exposure to media and the arts. One of the topics in the interview is what *art* means; this question is asked in the cultural probe materials (on a postcard) and during the interview, where I follow up on this question and ask for examples of artworks and aesthetic experiences. My question is ambiguous and abstract: "What does art mean to you?" This can also be understood as "What is art?", which is obviously a challenging question. By using this type of question and employing photos, I intend to elicit a dialogic way of "reflecting" in the interview, which refers to eliciting multiple positions or "voices" that may not integrate.

In the portraits, I explore the notion of film group roles in the students' discourse. In this classroom study, the teachers randomly established groups and did not assign specific roles or tasks to students. The groups divided up the filmmaking roles and tasks internally and chose their own film content. However, it was apparent from observations during the filmmaking that groups delegated the tasks in a matter-of-fact way, with little discussion. Therefore, I asked the students about the division of roles during the interviews. I wanted to know how the students' prior levels of experience (in the area of designing) might impact the group roles. For example, would a student considered by others as having artistic or technical abilities receive a particular role?

My analysis of the roles students performed and the ways in which they negotiated with one another in these groups during classroom filmmaking explores how people take up positions and form relationships with others in a social interactional order (Goffman, 1981; R. Scollon & S.W. Scollon, 2003). Goffman studied the procedures of positioning groups, including gaining "footing" in a group, as discussed in Chapter 4.

My analytic approach to the working roles in the film groups (Table 7.1) is based on a general description of professional animated film team roles. The professional roles are compared to students' roles in their film groups. I understand the professional roles from discussions in the classroom by the animation teacher and from literature on animation practice (such as Furniss, 1995; Lord et al., 2004). A simulation of such professional film team roles (of live action films) for student filmmakers is used in other filmmaking work-

shops, such as at Station Next in Copenhagen (see Wad & Vesth, 2001) and suggested in a book on the practice of filmmaking in schools titled *Fokus* (Katz & Poulsen, 1997). Inspired by these sources, I devise a set of film roles suitable for analyzing the film group roles, or positions, taken by students in this case study, which is useful as an introduction to the portraits.

Table 7.1 below is based on my observations of roles in the *Metamorphosis* and *Out-breakers* film groups, as mentioned in Chapters 5 and 6. The roles that entail leadership in a film group are placed at the top, in descending order. The levels of responsibility for a given role are termed *primary, secondary*, and *shared*. *Primary* is my term for the student who took the most responsibility for a task; the *secondary* student took less responsibility but to different degrees. The term *shared* means that the students took equal responsibility for a task or role, although, for example, storyboarding involved all the students. The term *unclear* for Meta-4 means that I lack data because she was away for much of the week. The term *follower* for Out-4 indicates that she seldom spoke or suggested an idea; however, she *follows* storyboarding and joins when she get her "footing." The *activity level* (ranging from very high to low) in the filmmaking process at the bottom of the table is based on my overall assessment, confirmed by others' classroom observations.

Table 7.1

Roles and Activity Levels in Two Film Groups

Roles and activity levels in two groups				
Metamorphosis	**Anna Meta-1**	**Ben Meta-2**	**Celia Meta-3**	**Meta-4**
Storyboarder (develops concepts)	**primary**	shared	shared	unclear
Instructor (delegates roles, coordinates)	**primary**			
Editor (cuts film, places sounds)	secondary	**primary**		
Sound producer (gets sounds)			**primary**	secondary
Set designer (creates look and style)	**primary**			
Animator (moves characters)	**primary**		secondary	
Camera person (controls mouse, shoots)		shared	shared	shared
Assistant (helps designer and animator)			**primary**	secondary
Activity level	*very high*	*high*	*medium*	*low/ absent*
Out-breakers	**Dea Out-1**	**Emil Out-2**	**Out-3**	**Out-4**
Storyboarder (develops concepts)	**primary**	secondary	shared	follower
Instructor (delegates roles, coordinates)	**primary**	secondary		
Editor (cuts film, places sounds)	**primary**	secondary		
Sound producer (gets sounds)	**primary**			
Set designer (creates look and style)	shared	shared	shared	shared
Animator (moves characters)	secondary	**primary**	secondary	
Camera person (controls mouse, shoots)		**primary**		secondary
Assistant (helps designer, animator)			secondary	**primary**
Activity level	*high*	*high*	*medium*	*medium*

I suggest that the students' interest in filmmaking relates to their general activity level in the group process. I assume that their positioning in the film groups relates to what the individual students present in everyday life in school, where students continually negotiate social roles in the social system of the group and deal with conflicts of positioning.

The portraits unfold one by one and are followed by an analysis of each group's interaction order. The order is Anna, Ben, Celia, and the *Metamorphosis* group and is based on portraits of three out of the four members. Thereafter, I present Dea and Emil and the *Out-breakers* group and their interaction order, based on portraits of two out of the four members.

7.1.1. Portrait of Anna from the Metamorphosis group.

Anna (Meta-1) is 18 years old and dresses in a casual, feminine style. Her parents are divorced, she lives with her father, and her mother and little brother live in another town. Both parents are actors; her mother also writes plays. Anna goes to the theater frequently (as she reports, about once a week). Anna has acted in a short film (shown on DR TV 2006). Creative work interests her, especially "drawing and painting." Anna reflects on being known as the school's visual artist and as searching for an identity as an artist, but she is unclear as to what direction to pursue as a career in the arts. Anna said she is reluctant to use digital technologies and is often frustrated by them, but she said her computer is useful for writing, especially school assignments.

Anna likes to discuss and critique movies, TV, theater, and art, so much so that she believes it may annoy people. She thinks it is a waste of time to watch TV but that it is fine as a social activity, such as watching the *Orange County* TV series with friends, because she recognizes teen problems "from our world, because when they sit and talk about love, parents, money and school, then it is sort of the same."

Figure 7.1. Anna's drawing from the probe:The WINNER class.

Anna's probe journal includes a class portrait sketch for the school yearbook (left). The class is portrayed in costumes from a themed school party, where they won the grand prize; hence, a sign (Figure 7.1) reads "WINNER!" Anna shows herself left of the center, holding a paintbrush (to the right of Anna's face is a face with bubblegum).

Anna took 14 photos, showing buildings and their interiors as well as landscapes in the city, several with people. One photo shows her bookshelf, which is divided into books "for inspiration," such as *The Great Life Photographers*, and books she is "forced to use" for school. She compares herself with others, such as when she studies what they collect: "I look at other people's collections of music and books and clothes as a way to see who they are." She describes two photos of guitars; one guitar is part of a story about a fun evening in a karaoke bar that "made me think about how to find happiness…I am focused on what to do after school graduation…which is not to stand in a bakery or be a host at a karaoke bar…I am using the process of elimination." The other photo shows her brother's guitar, and Anna talked about his ambitions: "He has musical ambitions. His band plays all over. I am really proud of him." Both guitar photos bring up Anna's associations to ambition, talent, and future career.

Anna's keyword: energy

Anna referred to making art as a way to release *energy*; "Get some energy out and get some aggressions out," she said. She finds that making art helps her, especially "during a time when I was sad." Anna relates her artwork to her moods. It shows "such a difference, I think, in the things I draw when I am sad." Anna uses art-making to help emotions pass and as a way to "shut down a little and go into myself." She provided an example of how emotions pass: "I exaggerate wildly, I draw people that commit suicide and skeletons and monsters, all sorts of black stuff, because when I exaggerate in that way, it [emotion] passes much easier." She also said that art helps her when she is sad after a break-up. She then makes a "grotesque but good drawing," which also provides a sense of relief. Listening to music and writing songs also recharge her *energy*.

When asked about what art means for her, she responded that it makes her see more "than just what you normally see when you open your mind. I like that enormously…I find it full of learning, and in that way it gives me meaning." An excerpt of Anna's answer about what art means from the probe postcard indicates how art means "a lot" to her:

> It really means a lot! Maybe everything. I think that almost all art is interesting. Art makes me think and expands my horizons. Art brings emotions to life and makes me ask questions. Art and culture give life meaning and

CONTENT. Art is indefinable because different people have different values and beliefs about what art is.

Anna said she was indifferent to the required art subject this year because she already took the advanced art level. Therefore, she is "very glad that we had this project because otherwise I probably would not have learned anything new" and pleased with the resulting film: "I'm rather proud of it." She does not recommend rotating roles in a filmmaking process; she said, "For the best result, it is good to stick with the role that you get" because it is time to specialize "now that we are older, not like in elementary school." Anna would have found it "stressful" if roles had changed, such as if "someone had moved the figures instead of me…but no one really dared to, because it was my task, right?" She appreciated the "good partnership" with Ben and his knowledge of the computer. Anna, who found it complicated to edit the images and transfer files, said that such tasks "just made me feel overwhelmed."

Analysis of Anna: trying out her identity as an artist

Anna questions identity and her sense of belonging with art. Anna has a high level of prior experience and training in the arts, and she values having aesthetic experiences. A recurring theme is finding a direction for her talent. The search for identity circles involves imagining her choices, such as when she talked about the two guitars in her photos. I view her discussion of her brother's guitar as a counterpoint to the photo of the plastic guitar in the karaoke bar, although the two guitars appear together by accident. Anna is trying out positions for herself in relation to others and is considering her own and others' expressions of self and positioning in terms of everyday cultural practices with the arts. Making art involves relieving turbulent emotions and a renewal of energy. Art is related to her search for identity within herself, her ambitions, and the bodily sensations of relief and energy. Her energy is creative energy, and her discourse in the interview is about her personal, symbolically loaded expressions across the art disciplines (acting, drawing, and writing).

7.1.2. Portrait of Ben from the Metamorphosis group.

Ben (Meta-2) is 18 years old and dresses in a thrift-store style, combining clothes such as old suits with newer, casual clothes. Ben has a Danish Anglo background. His father is a musician; Ben has toured with him. His mother is a teacher. Ben learned to use a photographic dark room at an after-school youth center in Copenhagen (Kraftværket). He is interested in grassroots politics and history. Ben is critical toward mass media and news sources and indignant about what he calls "manipulation" of messages. In his journal, he

clipped ads from the student magazine *Chili* and a heavy metal magazine, commenting that these ads "use sex as a means to sell…which seems the same as in the *Iliad*." He reads a variety of newspapers and does not trust the Internet as a news source because there could be "some 14-year-old boy" writing the content. He is interested in what he terms a "high-low mix," such as when he is discussing philosophy with a classmate at the local pub.

Figure 7.2. Ben's photo from the probe: The ghost of the past.

Ben took 20 photos, many of which show signs on buildings and people in his local environment. For example, he took a photo that he calls a "ghost on the wall" (Figure 7.2). It shows a wall painting (graffiti) at school that Ben says signifies the school's Red (leftist) politics that "reach back to the sixties" and represents, to him, a "ghost from the past" of the school. His photos also show mass media and communication equipment, such as a telephone. One photo is of a school textbook that he chose to indicate his interest in studying Danish history. Ben also has photos of election posters, one of which shows a moustache drawn on a candidate. He associates this poster with a competition on a Web site for the most "fun thing" done to poster.

Ben's keyword: power

Ben often talked about relationships of *power* during the interviews. He talked about taking photos as a project outside of school, and he wrote in his journal about "making a photo series with poems and literature about the weakest in society." To him, art is a provocation, even though he may not necessarily like the work of art: "Art provokes me, but not necessarily for me…it is something that can stimulate my brain, make me think."

Ben repeatedly brought up the theme of how "historical knowledge…shapes people," and he finds it embarrassing if you forget history and culture.

Ben said that when the film group divided up its tasks, he wanted to contribute in the best way possible to the resulting film. He gave the example that Anna would be "the absolute best at drawing." His role as a techie gave him a feeling of power because the others depended on him. Although he was in charge of "the technical stuff," he felt that anyone, in principle, could have taken the responsibility, and he is "not particularly interested" in computers. Ben spoke of deciding to "learn something" and reasoned that if he was going to "spend so many hours, I want something out of it." He appreciated the hands-on, practical animation experience: "It was great…you could learn from scratch if you wanted and I wanted to." Ben found animation fun to work with because Anna was there. Without her, "it would not have been so much fun…it opened up so many possibilities for us because we could make human figures out of paper…she is so gifted." Thus, Anna ensured high aesthetic quality for Ben.

Analysis of Ben: questioning power

Ben questioned power and authority in the meanings he assigned to signs and symbols, and he discussed how people and concepts are represented in images in everyday life. He referred to the idea of "system Denmark" (referring to a system of bureaucratic control) to ads and consumerism, and to the ethics of how humor, puns, and sexual innuendos appeal to young people. For example, he mentioned the sexualized names in ads for cocktails. He questioned visual texts in his environment in terms of their *power* to manipulate and represent authority. He seemed to talk of provocation as experiencing art. His discourse is self-reflexive and colored by an identity search related to being politically correct. Ben reflected in the interview on discourses in his everyday life mainly from a sociohistorical perspective, with a critical view of mass media and an open attitude to "art."

7.1.3. Portrait of Celia from the Metamorphosis group.

Celia is 18 years old and dresses in a feminine, street style. She just moved into an apartment with some friends. Celia is Danish Asian and has an Asian name, but she was born and raised in Denmark. Her mother works in social services and her father was a cook before he died when she was about 12 years old. Her family is musical, and several members are professional musicians. She has experience with DJ'ing through her sister and likes the club scene. Celia enjoys going out, but she is busy with schoolwork and a job as a ceramicist's assistant. Music and dancing are important to her; her "mood" and her social life relate to music and dance. She finds inspiration in the youth-oriented arts culture in

Copenhagen; for example, she likes Husk mit navn, a Danish graffiti artist and designer. Celia wrote on her postcard that art relates to feelings and an awareness of everyday life and artifacts, and is "something that makes me react or feel something other people have created, something that is everywhere, in historical buildings, in architecture, in my room, on ad banners." She once took photo classes but stopped, although she said it is "fun to make pictures." Celia is reserved about her abilities with visuals: "I have never felt that I was someone who is really talented…I am pretty good at keeping myself in the background."

Figure 7.3. Celia's photo from the probe: The ugly hospital.

Celia took 20 photos that show public buildings, her own home, and other people's private homes. For instance, a photo of a hospital (Figure 7.3) shows "the ugliest building…big and sad and ugly and it brings back bad memories of visiting this hospital." She has 12 photos of a party where she and her brother and sister set up the music and worked as DJs. She spoke repeatedly of achieving harmony and how to overcome "ugliness." Several photos are associated with enjoying spaciousness and togetherness. An image of a landscape appeals to her because it "has so much space." But a photo that shows a food display at a local supermarket is ugly, according to Celia. The theme of arranging and creating her own apartment, her relationship with her family, and her social space are central threads in the interview. Celia described her social and aesthetic experiences with reference to emotions and kinesthetic, bodily sensations.

Celia's keyword: tingled

When asked directly, Celia said that she would have preferred to sit at the computer and had the feeling of "putting it all together." She gave the example of finding the sound, but then having Ben edit (or put together) the audio and sound in the film. She described how it **tingled** (Danish: *kriblede*) in her body to try sound editing because "you want to do that yourself, when you know where it should go…so I could get a sense of the whole process."

But Ben and Anna decided on editing, and "then they did the rest." She "could have exchanged" roles, but Anna was leading and knew what "was needed and the figures had so many parts" so that it was "clearly" Anna's role to move figures in the film. Celia considered it a good group, but added that they could have talked over the roles; she felt that four members were too many and that Meta-4 had nothing to do. Celia had the opportunity to "move figures only on the first day, otherwise I made backgrounds and did the sound…[and] I found it fun to sit at the computer."

She liked shooting the film, saying, "You could see at all times what the film looks like…it was pretty wild" to watch the film "develop." But Celia wondered how Ben ended up editing, even though he was not "a technical kind of guy." She described the initial montage of many songs on the soundtrack for the film, saying that the songs had to be "braided together a little better." These were later altered to just one continuous song (see Window 3 data in Chapter 8). While Celia did not say directly that she disagreed with the decision to re-edit the numerous songs, she called it unfortunate that the songs she had picked were not used in the end. Celia thought the process of making all the figures' parts move and establishing the sound element was quite complicated and was surprised at how many shots were needed for just one minute of film. She noted that perhaps someone "warned us" about the ambitiousness of the *Metamorphosis* film, but she did not realize it "until I tried it."

Analysis of Celia: wanting influence as an editor

I see *tingling* as a physical indicator of Celia's physical sense of wanting to try hands-on editing and gain a more influential role as an editor. Celia was a sound assistant, but she *tingles* to try editing when watching Ben edit and seems captivated by the technical production process. Her verbal discourses refer to experiences based on bodily awareness. As indicated in Window 2 in Chapter 8, Celia uses a kinesthetic approach to animating running; she mimicked the figure Daphne's running with her own body. She says art is what "other people have created." Yet I propose that Celia knows more than she can articulate (or does not want to brag) about composing music with software and as a DJ. Her discourse refers to playing an active, creative leadership role with music and dance activities outside of school.

7.1.4. Interaction order of the Metamorphosis group.

In the *Metamorphosis* film group, Anna, Ben, and Celia pooled their collective resources into an interaction order where Anna, the creative leader, was the primary, active person in the role of storyboarder, instructor, and animator. Their sum of competence with multimodal

design was high, and their interests as a group ranged across the arts. Their level of activity seemed to vary but was quite high. Their collective *energy* may have skewed their collaboration, as the talented, eloquent Anna and interested Ben ended up dominating the filmmaking process.

Anna, the creative leader, has high ambitions and intense *energy*. She aimed to make a complicated, filmic piece of artwork, but was reticent about digital technology and needed help with production and film ideas in order to realize her creative drive or *energy*. The other students positioned Anna as the school artist or the "absolute best at drawing," as Ben said. Anna's talent motivated him during the filmmaking and allowed him to gain position, influence, or what he calls *power* in a techie type of role.

As seen in Window 2 in Chapter 8, a central technological issue for the *Metamorphosis* film group was the complexity of their figures and the animation of "running." In the interviews, Anna, Ben, and Celia talked of designing and moving the many body parts as Anna's task. Below is an example of the meticulous crafting of paper shapes by Anna, showing one half of an arm and seven different hands for the Daphne figure in the film *Metamorphosis.* (I include these to illustrate the complexity and, in my opinion, the beautiful craftsmanship.)

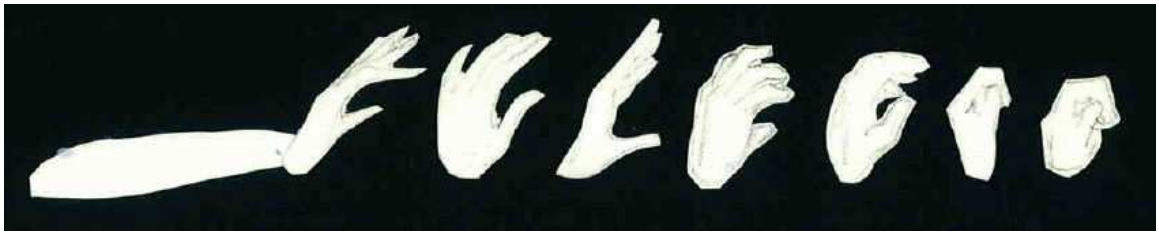


Figure 7.4. Examples of paper shapes (hands and arm) designed by Anna for the film Metamorphosis.

Crafting in terms of using software to animate the running motion of the figures was initially worked out in a cooperation between Anna and Celia, who crossed between virtual animation on screen and physical animation on paper. On Day 1, Celia actually moved the Daphne paper figure in a kind of role switch that Anna may be referring to in the interview as "stress." The so-called partnership or positioning with Ben seemed to solidify during the week, during which Anna instructed and animated and Ben recorded and edited. Celia gathered sounds.

The paradox is that the high *energy* of Anna as instructor and the *power* of Ben as a techie and editor may have hindered Celia's urge for editing as well as Meta-4's desire to be actively involved. Celia may have made an excellent editor and perhaps adjusted (or what she calls "braided") the many songs for the soundtrack, but Celia's *tingling* urge to try sound editing was frustrated. Perhaps Meta-4 was absent because she felt superfluous in a group of four. The *Metamorphosis* group had energy, ambition, and previous experiences to apply to filmmaking. But Anna identified with being an artist and with her leadership role. Ben found a position as techie. Celia was the sound producer but could not gain footing, and the sounds she got were edited and later re-edited by Ben and Anna.

7.1.5. Portrait of Dea from the Out-breakers group.

Dea is 18 years old, wears loose, colorful clothing, and has dreadlocks in her hair. Her family background is Danish Central European. She lives with her father, stepmother, and little brother, and increasingly with her boyfriend in his apartment. Her parents are divorced. Her father is a carpenter. Her mother now lives temporarily with Dea's sister and a new partner in the Middle East. Dea calls herself a computer nerd and said she knows this is "unusual for a girl." She is a music lover, especially of musicals, reggae, and playing guitar with friends in Christiania (formerly a hippie squatter area near the school). She enjoys analyzing music in school. For instance, she enjoys comparing Ramstein and Handel.

Dea uses the computer for gaming, composing music, and maintaining family bonds. Dea said she often takes charge or "leads unless someone opposes my leadership," and she prefers to play games alone because she wants to "control the mouse." Dea used to play games "a lot," especially *Counter-Strike* and *The Sims*, and usually watches one film every day. She found the probe difficult to do because it made her think about her media habits*:* "After school, what do I do?… Just sit and play on the computer…I didn't actually do anything, or, my day was so empty." Dea said that the probe made her think about being "addicted" to the Internet, music, TV, texting, gaming, and films. Dea was surprised to realize how much she is online and how frequently she uses SMS (short message service). When questioned in the interview about what art means, Dea associated art with going to boring art museums with her mom when she was a child and how she dislikes certain types of visual art (referring to older, fine art). But Dea likes body art, theater, and film: "I love it, it's cool [making]… art with the body…making combinations." Making backdrops for a film or a musical is "art itself" and she "adores music…it's a very big part of my life…100%." Dea has had jobs as a runner and assistant on film sets for her carpenter father at a famous Danish film company. Dea uses digital tools frequently, such as music software, to compose.

Figure 7.5. Dea's photo from the probe: Seeking contrast.

Dea interprets her photo of student art as showing a contrast between symbols (Figure 7.4). Dea said, "I thought that this was a cool picture…because there is art [in an] old beer box as if it is being thrown out…this is a great contrast" between beer and the framed artwork. She described another photo as contrasting naturalistic art with a collage of an art piece containing flower shapes. Dea took 29 photos that show scenes of nature, interiors of her home and her boyfriend's place, and school. Her photos include one of a sculpture that she found to be "ugly" and several of student artwork. Twenty photos include people, including classmates, friends, and family. Dea described photos of her "various computers at home" and said she "always want[s] to have [them] on." She also described how she and her boyfriend, value the potential use of a camera phone to document and expose injustice (she gave the example of police brutality). She referred to Jamaican singer and songwriter Bob Marley (1945–1981) when discussing her photos of the black, red, yellow, and green flags and a Marley poster.

Dea's keyword: interpret

Dea said she prefers art that "I can interpret." Dea wants to make "art with the body," not boring visual art, and she only likes abstract art that is open to interpretation. Dea also spoke of different ways of interpreting the clothes of fellow students. Dea said that the *Out-breakers* film was terrific and funny and that it was cool to make it. She knew nothing about animating and misunderstood the idea that the animation teacher was introducing physical, not virtual (CGI), animation, so "I did not know what they were talking about." Dea was unclear how the computers were used in the classroom during animation; "I did not get it about the filming, editing…when people started using cameras…with the computer." She found it difficult to design the film set and shoot the film with everyone in the same room; the room was too enclosed, with unstable light and too many people.

The *Out-breakers* group's brainstorming was inspired by "the children's TV show with the fruits, that opera series." Dea refers here to *Soup Opera*, animated shorts shown on TV (Bar-

rier & Clémençon, 1991, 2000). The group merged ideas into a storyboard, and Dea said she "had the idea in my head and wanted the others to follow along, but I'm not sure they liked it." She felt she could contribute in the sound and technical areas since "I made all the sound" and "I was the best at computers," but then she left the computing work to others. She thought that this shift in responsibility was "sort of selfish but…I found out how it worked…once I learned it, I could let the others continue" to shoot the rest of "the scenes with the pencils." Dea explained that she "always gets the leadership roles, ever since I was a kid" because she likes to take action. She added that "maybe I am too fast to take over, but we didn't have much time."

Analysis of Dea: searching for contrasts

Dea values *interpreting* signs and symbols, and she also values action; she talked of being someone who takes leadership. She gives the impression of being someone who is very social and busy, yet she talked of feeling emptiness in her daily life. Her prioritization of musical and bodily expression suggests that she is trying out agency by way of interpreting the possible meanings of her own and others' stylistic and artistic expressions. She explores the sensuous qualities of body art and other cross-disciplinary music, dance, performance, and theater. She initiates discussion about how her gaming interest may contrast with her pacifism and Rastafarian ideals. She defies what she calls "boring" views of art.

In her photo of the frames and old beer box, Dea reveals her struggle with formulating contrasts between genres and elite art; Dea is trying to show aesthetic sensibilities of taste. Her discourse is self-reflexive on her own lifestyle habits and art and media preferences. She seems to "think out loud" in her discourse about how she interprets art in relation to identity, as if she is testing or dialoguing with various possible meanings, especially *contrasting* the possible meanings.

7.1.6. Portrait of Emil from the Out-breakers group.

Emil is 18 years old, looks athletic, and has a sporty, casual style of dressing. He just moved away from his family (mother, stepfather, and younger siblings) in a provincial town and into an apartment with some friends in Copenhagen. His mother and stepfather are civil servants, and his father manages a small hotel. He has family in Scotland. Emil is interested in history and technology and is critical of news and media. He teaches swimming, volunteers as a mentor for troubled kids, and used to work as a model. He spoke of being a leader at his old school and being new in class. Emil used to draw, pointing out that "I drew a lot until I was 10, but then I transferred to a school where creativity wasn't such a big thing and then it just stopped." He concluded that he is not as "creative anymore."

Emil was a heavy user of games and movies when he was in his mid-teens, but he considers gaming and TV watching bad habits. He likes science fiction and satire: "I love…Shrek and Muppets Treasure Island…they have great songs…they are ingenious." He used to play the online computer game *World of Warcraft* (*WoW*), reaching a prestigious level as a leader of a 120-player guild. Emil relates his gaming habits to being bored in his teens while growing up in a provincial town, but he felt obligated as a leader in *WoW* and continued playing for "too long." He is "glad to live without" playing so much because it is "unhealthy to sit for so many hours in front of a computer." Emil still plays *WoW* on occasion. He plays racing, strategy, and combat games (*Dead or Alive*, *Burnout 3*), sees films, and plays board games socially.

He is very interested in history and is currently reading for the "tenth time" *The Song of Troy* by Colleen McCullough. He enjoys older visual art from the Golden Age of Painting (Danish, late nineteenth century school, representational), but drawings by his sisters or a talented friend are "meaningful and worth keeping."

Figure 7.6. Emil's photo from the probe: Making "a media cavalcade."

Emil took 13 photos that show his music and PC equipment, but he also took photos of signs and mass media in relation to the public or private sphere. Four photos include friends or him with his cat at home. His photos also include a series of three campaign posters. The poster (depicted in Figure 7.6) has graffiti on it. Emil spoke of his intent to make, "in a fun way," a photo series of posters to show me (the researcher) and dubbed this "a little cavalcade of media." Emil is interested in how the poster was designed, why, and how "they have hung the posters…with heads upside down." He compares political campaigns to TV debates, which he prefers for their in-depth discussion of issues.

Emil's keyword: grabbed

Emil spoke of being *grabbed* by (or interested in) historic sites, exhibits, museums, and other places and things, and how he moves on if it "doesn't grab me." This sense of being grabbed seems to be associated with experiences or depictions of experiences, such as a photo he took of the sun shining through clouds "hitting the water just right" at sunset, or an experience of walking in the Scottish highlands and hearing bagpipes: "Suddenly you can hear it echoing through the highlands…it's just fantastic." Art is what touches him or grabs him in a personal sense. Emil wrote about what art is to him: "I think it is very broad because art can be so many things. It can be a painting from the 1700s or an antique sculpture. But art for me can also be a photograph or a really good film, a good piece of music or just an ordinary drawing."

He said that "I am really crazy about old sculptures." On his initiative, his family visited archaeological sites, such as Ephesus in Turkey, where he was amazed by 2,000-year-old signs for a brothel with a heart, a woman's face, and some coins. He discussed two exhibits at the Danish National Gallery that he saw with his class: paintings by French Impressionist Henri Matisse and the "Mother" exhibit by contemporary artists Meese and Tal R. (Andersen, 2005). Emil had a negative experience with the "paintings entitled 'Mother'… which were of a giant pink castle filled with vulgar things and eggs." Emil questioned why anyone let the paintings be shown there, commenting sarcastically: "If I smear myself in egg can I stand in there, too?" The Matisse art exhibit was "okay to see…but…did not speak to me."

Emil saw himself as the animator in the film group, but he shared the instructor role with Dea, although she was more of a leader. He spontaneously compared his group with the *Metamorphosis* group, stating that their leadership in *Out-breakers* was "more egalitarian." When asked how ideas from the film emerged, Emil said he initially proposed the idea of escape: "There is a pirate captain in jail, and suddenly a giant ship charges through on wheels and takes the pirate and then they…sail away." The other group members liked the idea of "someone escaping," but they changed the idea into a school-related escape with pencils as figures representing students.

Emil described their animation process by saying "making our little scene was like a puppet theater," but it was difficult both to take charge of shooting and to act in the film, as he had to "hold my arm and take pencils and be…a robot-like Terminator." Emil explained how he misunderstood the onion skinning software function, which he found "by accident" and mistook for an advanced function. He even thought he had discovered or invented how to use onion skinning and mocks his own misunderstanding:

> You could move your hand and at the same time move something else…without it seeing my hand…it was a super program that could distinguish whether something was living if it had skin. But I quickly found out that it wasn't that. Then my optimistic thoughts fell and I thought it was too easy to make a film…a stupid thing, right. Progress, super technology, Emil becomes the new super soldier when he gets this suit made or something.

Emil calls it "amateurish" that the technical aspects of filmmaking were not clearer in the instruction. He was irritated by technical problems that hindered their attempt to shoot their film in the hallway, but was nonetheless pleased with the film: "It matched the music and was fine. It turned out well."

Analysis of Emil: personal criteria for art and technical tools

Emil spoke about a set of personal criteria for what art is and what *grabs* him aesthetically; he referred to a clear sense of taste regarding what makes good or bad art and the value of aesthetic experiences. He referred to the beauty of nature, such as the beauty of the bagpipes in the Scottish highlands. He also appreciates ancient visual representations, such as the signs for a brothel. His interest in drawing dwindled because, as he says, "creativity wasn't such a big thing." Emil's mistaken "discovery" of a special feature of the software is actually clever and similar to filmmaking techniques (such as blue screen). It suggests that Emil thinks about the affordances of software tools and was frustrated by the lack of technical know-how regarding animation in the classroom (see Chapter 9 for information about the technical problems that hindered the shooting of their film and a discussion of digital software and the pedagogical implications). He has a high level of prior experience and expertise with the creative aspects of digital software from playing *WoW*, using the Internet, and pursuing his interest in CGI animation (such as *Shrek*).

Emil reflects critically on how mass media construes representations, as in his "media cavalcade" of campaign posters. He negotiates his individual identity in relation to what *grabs* him and suits his taste, but he also pays attention to the political meanings. He engages in a discourse about culture with a strong critical sense of media, a personal taste toward aesthetics, and various sociohistorical perspectives.

7.1.7. Interaction order of the Out-breakers group.

The dynamics of Dea and Emil in the *Out-breakers* group is remarkable in regards to their sum of gaming experience, interest in film and the arts, and technical ambitions. As Emil said, the leadership, or their interaction order in the *Out-breakers* group was relatively egali-

tarian when compared to the *Metamorphosis* group. Dea was the primary leader but shared this role with Emil. I suggest that Out-4 is not "equal" but marginalized in the group. It is striking that Dea and Emil both have an active interest in making films, as well as previous experience with gaming and digital technology, and both describe themselves as leader types. Their sum of competence with multimodal design is high. The *Out-breakers* group experimented with the technique of pixilation; they animated human and non-human objects in their film, including Emil's arm, a table, and their pencil puppets. Dea's interest in music and *interpretation* complements Emil's creative drive and search for what *grabs* him.

The interviews with Dea and Emil corroborate a hypothesis about the confusion regarding animation, which I observed during the filmmaking week. Based on my observations of the class, I know that the students asked repeatedly why it was not possible to animate the eyes of their pencils with software. The interviews confirm that Dea and Emil confused physical animation and CGI. They seemed to expect something else, which Emil's misunderstanding of onion skinning demonstrates. I hypothesize that there is a mistaken understanding between their previous experience and advanced skills, and the relatively basic level of software programs used in the classroom. This misunderstanding can also be due to the instruction and the teachers' misunderstandings of questions from Dea and Emil about the software's capability to animate eyes. (I discuss the teachers' view in Chapter 9.)

7.2. Synthesis of Portraits and Film Groups

The following synthesis focuses on the individuals and their interactions in the two film groups. The five student interviews point to the development of "designing and reflecting" and touch upon issues of agency and identity. The groups' roles relate to the group dynamics, the positioning for power, and the right to interfere (as Goffman suggests). Below, I discuss roles and status in the film group and question the interaction order. I focus on the role of editing, as editing appeared to be a desired role and stirred conflict. Thereafter, I discuss personal identity in terms of themes collated from data across individual portraits. I end by positioning the data within analytic perspectives from cultural studies.

I view identity here as relating to previous experience with the arts and cultural affiliations. I look at both the interpretation and the design (and production) strata of prior experience, including the arts, film, and mass media. As reviewed in Table 2.1, I see semiotic processes in light of a cultural view of agency as creative and refer to the pragmatist aesthetics view of talent and experience in order to approach how the students are "designing." My approach is inspired by Burn and Durran's model of media literacy (2007), Bruner's notion of cultural narratives, and Willis (2000), who offers a view of art as a human meaning-making

process that serves to reveal creative agency (pp. xiv–xvi). Thus, the creative aspects of meaning-making are, metaphorically, or what Willis terms a cultural birth of the self (2000), whereby we build social connection that enables us to connect our biography to our history. This parallels what I draw from "cultural narratives." I explore this cultural approach in this synthesis.

I am interested in how the students talk enthusiastically about their experiences with the creative arts during childhood and their mid-teens. However, Anna stood out; at 18, she seems to have an identity as a semiprofessional artist. Celia and Dea compose and play music, dance, and do theater work. Ben takes series of photos about people on the streets; he also takes other portraits. While all the students described childhood experiences of making art (across the arts) as meaningful, they chose other pastimes in their early or mid-teens, with the exception of Anna.

The students gained a great deal of exposure to the arts from their families. Anna knows about the backstage work of a theater from her childhood. Dea helped her father work on film sets. Celia has musicians in her family. Ben and Emil recalled arts-related school projects. Three students have had paid work in art or art-related industries; Anna has acted professionally, Dea was a runner on a film set, and Celia currently assists a ceramicist.

A central question posed to the students was about their understanding of art: "What is art?" My collations of the students' answers provide a snapshot of the students' views on art. The open question about art serves to illuminate the students' views, more than the question of what art is (which I do not attempt to answer herein). This question provoked and elicited various stories about the meaning of art. The students' answers related mainly to interpretation (reactions as viewers or audiences), but the students also reflected on content design and paid attention to formal qualities and styles of art. The synopsis below reviews the range of answers:

- Anna wrote about a personal and existential dimension of art: "Art brings emotions to life."
- Ben wants art that challenges him: "Art is about…provoking me."
- Celia defined art as something that elicits reactions or feelings: "Something that makes me react to or feel something for what other people have created."
- Dea prefers art that she can interpret as opposed to boring (old) paintings: "I like art with the body…in combination with the body."

- Emil spoke of genre in a similar way to Dea, but he is provoked by what he sees as the ugliness in a modern art show, and he prefers older works: "It can be a painting from the 1700s or an antique sculpture."

Consider how Willis and Bruner describe a dynamic, interactive process through which we make our cultural worlds and narratives—and, thereby, make ourselves. The reception of texts, whether films, TV series, or books, thus involves interpretation and "reflecting" on meanings and is inseparable from the "designing" (as discussed in relation to social semiotic theory). All the students talked and wrote about their consumption of mass media (gaming or watching TV series or films) with friends and family as a social activity, where they often interpret the content. Several students mentioned social issues and political activism (Ben), photographing the downtrodden (Ben), or documenting injustice (Dea). Others were interested in representations in campaign posters (Ben, Emil). Ben talked fervently of social justice and how he interprets symbols as representing political meanings, such as the ghost painted on a once politically Red school in his photo. Ben and Emil took a sociohistorical perspective on culture and referred to artwork and symbols from various civilizations.

The students participate in subcultures, and I want to highlight two global subcultures that are uncommonly interesting due to their very particular practices. Dea identifies with Reggae and gaming, and Emil has participated intensively in the online game *WoW*. Participation in an online global game is an example of a cultural practice that carries different meanings and identifications: Emil mentioned having too much responsibility as a guild leader in *WoW*, and Dea referred to herself as a computer nerd, which she knows is unusual for a girl.

7.2.1. Discussion of the portraits.

The students' social and cultural themes suggest that ideas of aesthetics and art are embedded in sociocultural and historical discourses. Their experiences with the arts and the dynamics in their film groups relate to factors beyond this study. This study does not correlate portraits with academic achievements, the social web of interrelatedness of the class (such as the friendships and cliques), the individuals' social class, their family structures, their psychological profile, and so forth.

The content of their probes led me to question the students' lifestyles and how their lifestyles influence their school involvement in general. I do not bring specific lifestyle practices into the analyses of the portraits because they are too personal; the inclusion would be

unethical, and it does not serve the focus of my research question. However, it may affect their roles as winners and losers in general.

My analysis of the students' transformative processes and reflections about self in relation to others and what can be called "identities" relies on their reports and their external expressions in discourses, such as style of dress, selection of photo topics, and narratives about the photos. These expressions are not random or arbitrary but rather motivated and intentional external discourses that are representations of a person's sense of self and inner experience. The expressions can be seen as assisting the students in establishing their own social positions and their understanding of who they are in relation to overarching cultural, social, and historical discourses. Again, my view is limited; it is not possible to study inner processes such as thinking or identity directly, and I can only rely on making hypothesis and models of interactions such as self-other-sign (Figure 4.1) or Animating Symbols (Figure 1.1). Also, I do not follow the students as they transform over time, and I cannot follow their development toward a presumably more stable adult identity. I discuss the influence of my methodology, interviewing process, and rapport with the students in the critique in Chapter 10.

8. Filmmaking: Analysis of Designing Multimodal Texts

Chapter 8 presents the data extracted from the students' multimodal actions of designing their film texts, taking place in the classroom during the week of filmmaking. It presents video data transcripts with stills and visual texts in the form of storyboards. Chapter 8 analyzes and discusses how students as filmmakers are making semiotic choices, and explores why their particular semiotic choices change during the week of filmmaking. The semiotic choices in the finished films are discussed in Chapter 9.

Chapter 8 is organized so that it starts with excerpts of data, constructed as three different but related "windows" of nexus analysis using MDA. With these windows, I explore the ways in which the students design and reflect on the semiotic processes of filmmaking. The data presented in the three windows concern the following classroom filmmaking activities.

- Window 1 is about storyboarding in the pre-production phase
- Window 2 is about onion skinning in the production phase
- Window 3 is about reflection during the critique session in the post-production phase

I apply the MDA approach for exploring the social action of the designing and reflecting, with focus on the areas of primarily discourses in place, and secondarily experience (R. Scollon & S.W. Scollon, 2003, 2004), as reviewed in Chapter 5. The analysis also refers to concept of design and production strata (Kress and van Leeuwen, 2001) discussed in Chapter 2. My analytic focuses are on the aspects of (1) composition and (2) resemiotization. The aspects of composition and resemiotization are explored by doing a micro-analysis of how composition as action occurred in selected film groups, when the students composed ideas on their storyboards, and when they animated figures with the onion skinning function of the digital software. Chapter 8 explores how the students used active, embodied practices of composition and resemiotization.

In Window 1, there is a combination of a textual-visual semiotic analysis of storyboards with the MDA nexus analysis of filmmaking actions. The combination reveals how the students are designing and reflecting in terms of the storyboard, and I argue that it not only is used to negotiate meanings about their ideas, but also keeps the scenes in order as a type of blueprint for how the final film will read in the end and is a group contract. A storyboard as a text uses modalities such as drawings, written words, numbers and other signs that aid

in the representation of position of sequences. The semiotic analysis reveals how storyboards follow layout conventions (such as reading top to bottom and left to right) like a comic strip. Analysis focuses on what function the storyboarding served, as indicated in group discourse (as oral discussions, gesturing, etc.) and captured with the MDA framework.

In Window 2, the focus is mainly on how the students learn to use the particular software function of onion skinning, showing events in the film group both "before and after" using the software function.

In Window 3, the focus is on the critique session in the classroom and also contains much spoken discourse in the genre of an oral and visual class presentation. The rough (unfinished) films were the subject of the discourse, i.e., the students' reflections are framed within the critique session in class. As art educators (Raney & Hollands, 2000) point out, there is a long-standing art education practice for eliciting verbal responses in art, such as the student critique session. In Window 3, I try to expose what the students verbalize and embody in their communication, such as how they gesture to show ideas when they present their own films. In Chapter 8, I am interested in exploring student reflections as they emerged (while the students are still involved in filmmaking), whereas in Chapter 7, my interest is to capture examples of students' reflections when they look back on the filmmaking workshop experience.

As explained in my research question, I aim to expose how designing unfolds as a process of reinventing language. This is related to aesthetic sensibilities and how reflective processes may transform the individual's thinking but this evolves in relation to others, such as during the semiotic processes of film production. In Window 3 of this chapter, I explore how the students reflect by conducting an analysis of their use of multiple modes of communication (including speech, gesture) while they present their animated films in the classroom.

My aim with the data analysis in this chapter is to uncover examples of how the students chose semiotic resources for their films, and what their choices meant to them. In their filmmaking processes, the students select from multiple modes of action while they choose from semiotic resources from which to construct form and meaning (semiosis) in the films (van Leeuwen, 2005). The data in Chapter 8 are complex, dense and "messy," and my methodological approach is experimental.

The filmmaking process is framed by teacher practices, the school context and the physical and virtual materials chosen and made available to the students in this particular case study (the particular software and so on). At the end of Chapter 9, I discuss how the in-

struction and hindrances in realizing film ideas may have impacted student experience and how social group interactions, such as filmmaking roles and division of tasks in the film groups, impacted as well.

The transcripts in Chapter 8 refer to students' embodied actions on video stills (actions are described in parenthesis and refer to video, for example still 0:51), but only exemplary stills are reproduced herein with figure numbers. (Viewing instruction for full appendix: please view the edited video clips of data from Windows 1, 2 and 3 in connection with reading this chapter. See Folder 2_Filmmaking: subfolder Microanalysis_windows 1, 2, 3, which run 5, 4 and 13 minutes, respectively.)

8.1. Window 1 on Filmmaking: Storyboarding as Actions and Texts

This first Window on filmmaking is based on the MDA (R. Scollon & S.W. Scollon, 2004) approach combined with an analysis of storyboards (as visual text) in order to construct several trajectories around the nexus of student designing. The MDA approach is combined with iconographic and social semiotic analyses (van Leeuwen, 2001) to the visual text of storyboards. I analyze the storyboards of both the *Out-breakers* and *Metamorphosis* groups, and I compare the *Metamorphosis* storyboard to the final film. I use the data of the two film groups in tandem in order to offer overlapping angles on the actions of filmmaking in the classroom. Methodologically, two film groups are used to draw some comparisons from the storyboarding process, albeit the data available are somewhat different.

Window 1 on storyboarding is constructed from the following data.

- Transcripts using the MDA approach to analysis documenting the *Out-breakers* group
- Storyboards as visual texts with a brief comparison of the two storyboards for the *Out-breakers* and *Metamorphosis* films
- A comparison of how the *Metamorphosis* group's storyboard corresponds to the *Metamorphosis* group's final film text

I view their storyboards as being blueprints for films as they are key for my interest in tracing how the main ideas were altered (or transduced) in their film design.

As an introduction to the storyboards as data, I need to review my use of terms: *transduction, panel* and *shots*.

As mentioned, the term *transduction* is used in social semiotics to refer to a process of shifting modes (Kress & van Leeuwen, 2001, p. 51) and every act of realization involves processes of *choices and transformations*.

A panel is a comic-art term (McCloud, 1994, p. 66) for the small, rectangular, framed images used in the storyboards.

The term *shots* refers to the use of various ways to shoot a film and show an illusion of motion (see Chapter 3 and Table 6.2: Levels in an animated film text (template) adapted from Iedema). Shots can be full (showing full figure), half (half figure), and close-up. Close-ups may be reaction shots that show faces. In the transcription, the students use terms for shots (albeit not always correctly) and how the camera may appear to zoom in or zoom out, and the different distances of camera to the subject. The notion of shots thus also refers to how figures as subjects may be oriented toward each other in the storyboard or film, i.e., how the figures move in response to one another, creating vectors.

I apply the above definition of transduction to my filmmaking data as an analytic tool for understanding how the students chose to design their semiotic modes, ideas for the content and sequential structure, and how they arranged the ensemble of modes in a narrative film structure. When a new ensemble was being designed, the students transformed meanings by juxtaposition, as in the use of the interplay of specific sounds and images. During storyboarding, the students transduced their main ideas across modes, and transduced again from storyboarding to the production of sounds and images edited into their final animated film.

Analytically, I view the teachers as facilitators of storyboarding and highly relevant in terms of student activities, but I have chosen to place the students in the foreground and place the impact of the teacher's facilitation in the background until my review of the pedagogical approach and my discussion at the end of Chapter 9. However, the reader needs to know some background to grasp the data. The students were instructed by the teachers to work with storyboarding during the pre-production phase of filmmaking and to thereby consider what I call semiotic choices. The animation teacher encouraged the students to use various types of shots.

Prior to the activities transcribed and shown in Window 1, the class was divided into five film groups. The animation teacher introduced and assigned storyboarding and compared a storyboard to a comic. She also asked each film group to develop a main idea and to write a synopsis of their film narrative for a later presentation to the class.

8.1.1. Window 1: data presentation of mediated actions.

Window 1's analysis of storyboarding in the *Out-breakers* group video data consists of three transcripts that occurred in real time before and after lunch during the pre-production phase (Day 1: at 11 a.m., 1 p.m., and at 1:30 p.m.). Each of the three transcripts on storyboarding is described and analyzed below, while a collated analysis and discussion of storyboarding is presented at the end of the Window 1. The storyboarding process also indicates social interactions and group dynamics, such as how Dea and Emil were the main speakers but Out-3 also joined in to the discussions. These three students took turns in speaking, often overlapping and interrupting each other. But Out-4 rarely speaks or takes the initiative.

Introduction to Window 1: Transcript 1

In Transcript 1 of Window 1, the four students in the *Out-breakers* group discuss how to make their first storyboard and their film. The four members of the group review the *Out-breakers* group's film ideas with reference to ideas they already sketched in loose, thumbnail sketches.

Dea redraws these thumbnails into a notebook and makes the first *Out-breakers* storyboard. (They later rework this to a second storyboard, see Transcript 2).

In the Transcript 1 data (below), the group discussion revolves around the organization of their ideas for a narrative progression of the main idea of "breaking out." I interpret their discussion as about choosing the right semiotic means for communicating the theme of breaking out multimodally. For example, in the first line of the excerpt, Dea says "…we say that this picture is where they all lay still," where I understand that "this picture" (or small picture frame) refers to what I term a *panel* of a storyboard. Dea also mentions panels later, when she says, "the next one." Dea talks of representing how they (or the pencils, as film figures or characters) are meant to lay still. In the excerpt, Dea talks of "you" several times, such as how "you know" that the pencils are shut inside. I understand "you" as meaning the audience, and "know" as how a viewer knows (reads) the film. In the latter part of the transcript below, the students Emil and Dea turn the discussion toward planning the actual film production. (Their bodily actions are written in parenthesis.)

Window 1: Transcript 1

Dea	*OK, but we say that this picture is where they all lay still and the hand comes, right?*
	Yes.
Several.	*(laughing)*
Emil	*Or maybe a pencil should come up here?*
	No.
	That would be too much.

Dea *Yes.*
Emil *Just the one about how they do that.*
Dea *Then you know that they are trying…*
Out-4 *Yes*
Dea *OK*
Um
Out-4: *Is the next one the one*
with the zipper…?
Dea *From here.*
Out-3 *Then they get shut inside, right?*
Dea *…You see the big pencil case and zipper*
And then you know
that they get shut inside
And then you see that it gets zipped.
Last picture.
There is a total close-up.
Yes.
Out-4 *Then it jumps.*
(Dea is drawing.)
Dea *Clap [Slam]*
(Dea claps her hands)
Haa, haa, haa.
Oh, how totally awesome man
(The clap is shown in Danish transcript: stills 0:51 and 52.)
Emil *Can you see what it says there?*
(Emil turns to answer someone in another group… then turns back)
OK.
Our figure design we already talked about.
Background, we also discussed that.
When we are going to animate and all that.
Background sound and all that.
Yes, um, well we can't really actually go about doing it…
Our good story, we have that pretty well under control.
Dea *So we should go about it like this.*
So we should try to write it all down
and write the sounds down [on the storyboard or on another list]
So we have all those things?
Out-4 *Oh, right, yes.*
Out-3 *Yes.*
Dea *We might as well do all the background work we can do ahead of time.*

Analysis of Window 1: Transcript 1

In Window 1: Transcript 1, I am primarily interested in how the group talked about and enacted the transductions among modes, such as how the group tried to work out the integration of the visuals and sounds in their film. One example is how the sound of a clap is used by Dea to accompany the visual image and communicate what she calls "where it jumps," which I believe refers back to the main idea of representing pencils breaking out. The group discusses jumping in their selection of audio and visual elements. Dea talks of using sound to strengthen the effect of the pencils jumping, perhaps inside or out of the pencil case, when she says clap (or slam) and claps her hands loudly (in video still 0:51 in appendix). The clap appears to be correlated to the idea of using the sound of a door slam-

ming, but this is ambiguous. The group has also discussed whether to use the sound of a zipper and footsteps as part of an ongoing discussion of which sound effects to be used in the film.

After the clap (see video still 0:52 in appendix), Dea smiles, laughs in what sounds like a mocking laugh (haa, haa, haa) and says "Oh how totally awesome man." She communicates her interpretation of the film effect (of sound and image) when she claps her hands loudly, smiles and laughs. I interpret these actions as an embodied demonstration and reaction to the effect of sound. She communicates to her group that she anticipates that a combination of audio and sound will be "awesome" as a unique code for the semiotic ensemble of the *Out-breakers* film.

The film group is storyboarding and trying to transduce modes and transform ideas. One way this experimentation is accomplished is by the performance of sound, as in the clap example. This experimentation is done while they negotiate the plans for how their film synopsis, i.e., their written idea for the narrative about breaking out, will be made into a film. The narrative is transduced, or crosses between modalities, as they work on visual ideas in the form of storyboard drawings. This transduction is structured by the panels and sequencing of the storyboards. For example, when Out-4 asks, "Is the next one the one with the zipper…?" and Dea answers, "From here…" while Dea points (off camera) to a panel on the storyboard. The group discussion about the narrative sequence refers to the storyboard and the film, such as when Out-3 asks, "Then the pencils are shut inside, right?" After which Dea remarks, "And then… you know that they are shut inside and then you see that it gets zipped." She then refers to the last storyboard panel as being a total close-up and to plans for using a type of shot. This exchange is exemplary of the way in which the group simultaneously discusses and integrates modalities with the narrative flow of story while its members draw plans on the storyboard.

Dea is particularly interesting because she voices a practical approach to the act of transducing multiple modalities as she draws the group's film ideas onto the storyboard. Dea talks of how the storyboard can function as a plan for the film's production and suggests that they make a list of what must be prepared (props and sounds) in order to produce the film. At the end of Window 1: Transcript 1, she says, "So we should go about it like this, so we should try to write it all down and write the sounds on…we might as well do all the background work we can do ahead of time…." Dea indicates that she wants to transduce the mode of the storyboard as a blueprint to the realization of storyboarded ideas through a practical production orientation of filmmaking (as action) and film result (text).

Introduction to Window 1: Transcript 2

The stills below show the students working out ideas for their *Out-breakers* film. Three group members are present, but only Emil and Dea speak. They discuss their second, more detailed storyboard that Dea is drawing, based on their first, smaller storyboard. The *Out-breakers* group and the art teacher previously discussed how to include more close-ups in the group's second storyboard. In the following stills, the students discuss sequences of the final film and how to shoot the film while Dea draws Panels 9 and 10 of the second storyboard. Figure 8.1 below shows video stills side by side that indicate Dea's quick movements with her drawing pencil as she points and says, "These two here." In the background, placed in front of Emil, is the first *Out-breakers* storyboard.

Window 1: Transcript 2

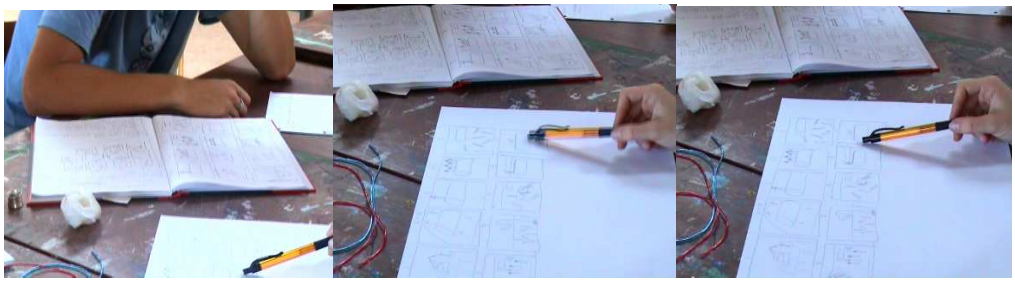


Figure 8.1 (Video stills 3:11, 3:14 and 3:15). In the foreground, Dea is seen moving her drawing pencil between the two panels, numbered 9 and 10, of the second Out-breakers storyboard.

Dea	*Yes.*
	These two here
	can be in the same cut
	where you just hear someone going out.
	That we can actually shoot it, to put it bluntly.
Emil	*Yeah.*
Dea	*Without help from sound maybe, right?*
Emil	*That's it.*
	You can't make all of that in one
	where you both
	have to see it and then
	back and …
Dea	*No.*
Emil	*The click*
	and then in on all that
	and then get the pencil?
Dea	*No, yeah…*
Emil	*To get the eyes*
	and all that there.
Dea	*No.*
Emil	*Because it doesn't have that in the beginning, right?*
Dea	*No.*
Emil	*And the idea in the beginning is that*
	it has to lie completely still?

Dea *Yes, yes…*
Emil *So that then, all of a sudden, it smiles and then…*
Dea *Uhm.*

Analysis of Window 1: Transcript 2

Emil and Dea talk about Panels 9 and 10 of the storyboard in terms of what they want to represent in the film. They also get into detail about how to actually organize and shoot the film scenes. I am interested in how they talk about these semiotic choices while drawing the storyboard. I believe that the *Out-breakers* students worked with storyboarding as a blueprint and as an active *forum* for formulating and debating their ideas. They are composing the sequence of the film narrative (in the panels with scenes in the storyboard) and how to shoot the film.

Dea moves to the practical film production; how to shoot the film frames. When Dea talks of "cuts," she refers to a concept of taking continuous shots or film takes. (She seems to be thinking of shooting a live action film.) So when she says, "…can be in the same cut… that we can actually shoot," she is planning how to shoot their narrative sequence during the film production. Emil argues that shooting the beginning of the film with the middle scenes (represented by Panels 9 and 10 of the storyboard) will not work when he says, "You can't make all of that in one." Emil argues that it cannot be shot this way because eyes are put on the pencil figures later in the film. He says, "Because it doesn't have that in the beginning, right?" ("it" refers to pencil figure). Emil realizes that animation has to be shot differently.

Emil brings their discussion back to the film intention and the narrative progression of the pencils as they change from dead (and still) to alive (with eyes) when he says, "And the intention in the start is that it has to lay completely still." Dea attempts to plan the realization of their intentions in the time available for production, "That we can actually shoot it, to put it bluntly" and Emil answers, "Yeah." When Dea says, "Without help from sound maybe, right?", Dea and Emil are exploring possible alternatives for how visuals and sound will work together and are adjusting their semiotic choices in terms of the premises of this context for film production (time, materials, shots, etc.). They are using the storyboard as a semiotic tool for thinking about how to design their unique ensemble of sound and image in their finished text.

Introduction to Window 1: Transcript 3

Transcript 3 shows how Dea and Emil offer their views to the other group members on how to design visuals and sound in the film. I include these excerpts as examples of the many shifts in the ongoing semiotic choices that the *Out-breakers* made and to show the wealth of detail in the planning during the pre-production phase. Below, Emil discusses

with Out-4 and Dea whether it is a good idea for the figure of the master to turn the light on in the film. When Emil says "HE" (accentuating the word *he*), Emil is referring to the master figure, who they plan to represent as a human hand in their film. In Window 1: Transcript 3, Dea suggests changing the idea of using sound to using light to represent a filmic idea that refers also to her previous ideas about using sounds.

Window 1: Transcript 3

Emil *It's not like HE turns on the light,*
but more like it IS turned on
so that people notice it.
Something or other divine… retarded… something
(Still 4:11 shows Emil as he raises hands and vibrates when he talks about light. See appendix.)

[…short pause between excerpts]

Dea *In this scene,*
instead of clapping [slamming], right?
Emil *Um, yeah.*
Dea *Then we do it just where the zipper is being zippered*
so you see or rather hear or you see.
So then you can see that the light disappears,
that it's being turned off.

Analysis of Window 1: Transcript 3

In Excerpt 1 of Transcript 3 above, I am interested in how Emil contributes to the group's ongoing discourse about how the light will work and how the narrative fits in with the semiotic choices of lighting. Emil uses a discourse of how people, meaning the audience, will perceive and read light. Emil talks about how light can be designed to appear divine or, as he puts it, "IS turned on." Still 4:11 (in the Danish transcript in the full appendix) shows how Emil raises his hands and vibrates them (as in a gesture of blessing) while saying "divine" (saying it in English). However, right after saying divine, Emil uses a discourse of irony, saying "retarded… something," perhaps to add distance to the loftiness of the notion of divine light.

Emil thus argues that the *Out-breakers* film should use a "divine" source of light so that, although using the passive voice, it will look active when he says "IS turned on." Emil tries to work out the composition of the light and argues that light impacts the communication of meaning in their film, i.e., he expresses awareness of how a filmmaker can use lighting to frame or be a salient aspect in composition.

In Transcript 3 above, the group dialogue is about reconsidering a semiotic choice. Dea proposes an alternative to the idea of using the audio effect (probably door slam), and she suggests that lighting may represent meaning in a more fitting way than audio. Dea's

words stumble as she talks about the effect of what "you see" and what "you hear" (again, "you" seems to mean a film viewer), "So then you see or rather hear or you see…you can see that the light disappears." Dea rethinks the use of lighting as a semiotic resource, perhaps due to Emil's discussion about lighting. She seems to be working out a composition code for the *Out-breakers* film so that the film text functions as a whole. She also reflects on choices. These excerpts show how Dea and Emil continue to use storyboarding to play with how their ideas transduce, or to perhaps imagine how the film will look, sound and progress as a multimodal ensemble. Transcript 3 occurs later in Day 1 and the storyboarding process is further along by this time. The group is apparently transducing by increasing attention to details and what each mode offers for communication, such as the source of lighting.

Collated analysis of Window 1 on storyboarding as action

My collation of the video data on the composition of the storyboards in the *Out-breakers* group during the pre-production phase concerns two dynamically related actions of meaning-making:

1. *Embodiment* of multiple modalities in communication between students about composing ideas on a storyboard
2. *Transduction of modes* of communication. Storyboarding contributes to making semiotic choices about how to compose their film using the "apt" ensemble of modes for their film text.

The *embodiment of multiple modalities* when composing a storyboard was indicated in how the *Out-breakers* group arrived at their plans for integrating sound, lighting, visual effects, etc. The *Out-breakers* group used verbal and embodied modes of discourse in making the multimodal storyboard when, for example, Dea clapped her hands and laughed and used the slang expression "awesome" about the anticipated effect of image and sound, or when Emil raised his hands to show his idea of divinity. The point is that bodily representation was used in the *Out-breakers* group's communication and interaction in order to clarify and imagine aesthetic means for composing expression in the film. My exploration of filmmaking is thus evolving into a concept of embodiment in the design process. This concept harkens back to the body schemata theories (see Johnson, 1990, p. 65) that describe how imagination projects such schemas, or from one domain onto another as projections of metaphor. Their bodily based actions of communication may indicate this type of projection.

The *transduction of modes* involves working out the means (visual, audio, etc.) for constructing the meanings in the film that are drawn by the students onto the storyboard to create a

blueprint. The group thereby selected audio and visual resources of sound and lighting that were the most appropriate to represent ideas in the film and that considered how other people will view their film.

In summary, storyboarding is a forum or platform for transduction and a tool that supports the thinking of the students in terms of gathering, concretizing, reworking, discarding or keeping ideas. These activities exemplify how complex and multilayered the composition of a multimodal text is. The *Out-breakers* group transformed a vast vocabulary of symbols, signs and icons as they discussed how to animate their ideas as a multimodal ensemble. The two, dynamically related, semiotic activities in the *Out-breakers* film group involve *embodied modes* and *transduction of modes* in their storyboarding process.

8.1.2. Window 1: Data analysis of two storyboards.

In this presentation of data on the storyboards, the *Metamorphosis* and *Out-breakers* films are approached as iconographic visual texts that have similarities with the genre of sequential, comic works of art, but also as blueprints for a film. I use a Panofskian-inspired approach in the treatment of storyboards because iconography is more oriented to the subject, rather than the form. The iconographic analysis of the storyboards is also informed by my analysis of the *Out-breakers* video data transcripts on storyboarding.

Introduction to the comparison of two storyboards

I construct a partial comparison of the two student groups in order to explore their differing uses of the storyboarding process. I am interested in studying the storyboarding process across two film groups in order to track whether and how the groups did transformative semiotic work (such as transduction) differently, especially in regards to using sound and visuals. I also explore, once again, how the students transduced their main ideas for their films from the static medium of a storyboard into an audio/visual ensemble of the animated medium of film. I also look for indicators of visual motion and timing of this motion, as well as plans for sound on the storyboards. A few examples of the graphic representations in the storyboards of the *Out-breakers* and the *Metamorphosis* groups are described.

A comparison of the *Metamorphosis* storyboard to the corresponding film, a comparison of the two film groups and a discussion of findings follow the presentation of data.

Presentation of *Out-breakers* storyboard

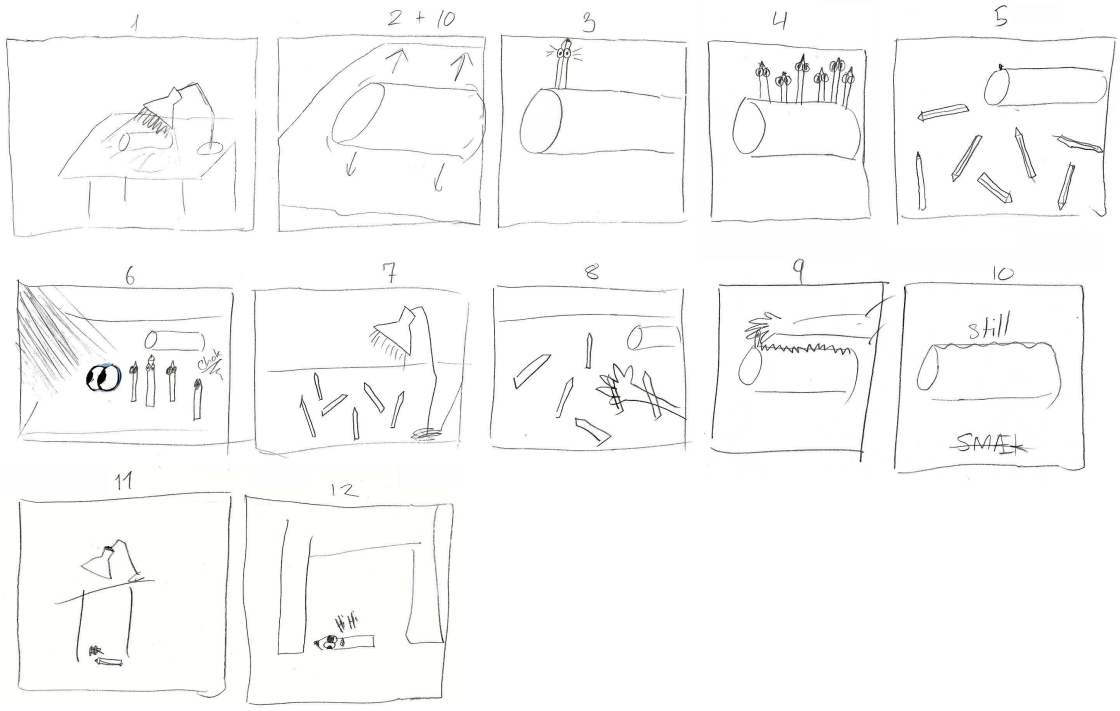


Figure 8.2. The Out-breakers storyboard, reproduced at about 30% of its original size. It is the second storyboard designed by the Out-breakers group.

I use numbers 1-12, to refer to the panels, as marked on the *Out-breakers* storyboard (Figure 8.2) by the students. I aim here to analyze how this storyboard represents the main filmic idea of entrapment and breaking out toward freedom. I explore how the storyboard refers to multiple modes and how it braids together the visuals and sound. It also indicates the overall temporality, as movement over time, and *tempo* of the film. I present two examples below of how the storyboard constructs meaning and is used for planning a multimodal ensemble of semiotic resources to represent *movement over time*.

First, the *movement* of pencils creates the illusion of life or animates the pencils. Movement is described on the storyboard by means of instructions drawn in the panels that notate figure movement. The numbers "2 +10," written above Panel 2 of the *Out-breakers* storyboard, refer to plans for shooting the film as Dea and Emil discussed (in Transcript 2). Panel 2 has arrow symbols pointing up and down to graphically indicate the movement of the pencil case in order to create the effect of the pencils inside the case coming alive (or becoming animate rather than inanimate). Panel 10 has the word "still" written on it, which I find indicates an instruction to start the shot with a still (static) pencil case, then later to make it move (as if shaking). Panel 10 has similarities to Panel 2 in the use of camera distance and the central placement of the pencil case.

Second, the design of a multimodal ensemble *over time* is indicated by the icons used for sound and light in the *Out-breakers* storyboard's Panel 6 (Figure 8.3 below).

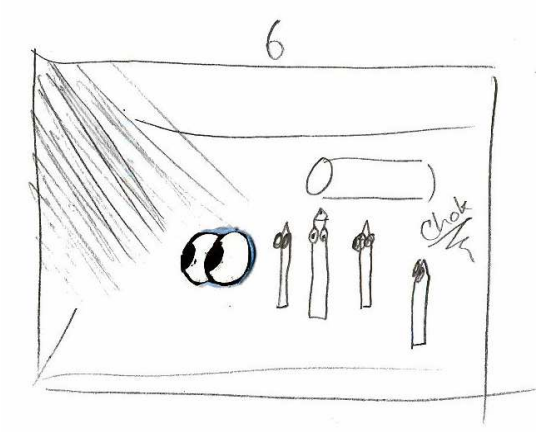


Figure 8.3 The Out-breakers storyboard's Panel 6

The figures (pencils) and pencil case are represented in the panel, and the written word "chok" (English: *shock*) is an internal working note on the meaning the students intend to convey. Two large eyes are exaggerated in size and are made out of a different kind of paper pasted onto the storyboard paper using an adhesive. The large eyes are designed to indicate gazing at and "shock" in reaction to what is occurring to the left. To the left in Panel 6 (Figure 8.3), graphic representations of ambient sounds (the door creaking and footsteps heard in the film) are shown on the storyboard as uneven, diagonal sets of lines. The representation of eyes that are looking left and lines in this panel (probably) represent plans for audio in relation to motion. The panel thus indicates a juxtaposition of sound, motion and visuals planned for film production. The large eyes in this panel show the direction of the gaze of the pencil figures and are used to graphically show *vectors* of action planned for the film.

Analysis of the *Out-breakers* storyboard

The intended meanings of the *Out-breakers* group and the main idea of entrapment are carefully planned and drawn on the storyboard in order to integrate the audio and visual modalities. Note that the *Out-breakers* storyboard references audio in Panel 10 (Figure 8.2), where the word "SMÆK" is crossed out, perhaps due to the discussion of using lighting versus sound effects, as I reviewed previously. The word *smæk* may refer to the sound of a zipper or a door slamming, which was embodied as Dea's clap. I interpret this as being ambiguous, as *smæk* is written in the same way that comics use words such as *BLAM* or *VROOM* to indicate *ambient* sound and are signifying events occurring beyond what is de-

picted in the panel. The word "hihi" written on Panel 12 presumably refers to the intended use of laughter for the pencil figure at the end of the film. The modality of sound was referred to in relation to the *Out-breakers* storyboard, but listed separately by numbers that corresponded with the storyboard and were discussed in the group during the storyboarding process. In summary, the *Out-breakers* storyboard uses a rich visual grammar and written words to show how to transduce audio and visual modalities over time. The storyboard exemplifies the complexity of the pictographic language, as reviewed in Chapter 3.

Presentation of *Metamorphosis* storyboard

Figure 8.4. Storyboard for the Metamorphosis *film. The storyboard was originally drawn on two pieces of paper and it has been darkened and reduced to about 25% of its original size.*

I refer to the storyboard for the *Metamorphosis* group's film by labeling the Panels 1-20 (as in the layout of numbers on the *Out-breakers* storyboard, Figure 8.2) since no numbers were marked on the panels by the *Metamorphosis* group. I also refer to the rows as numbers 1-5 from top to bottom. The storyboard (Figure 8.4) displays graphic conventions, such as the use of the Greek frieze as a border design, indicated with the word "gennemgående" (English: *ongoing*), and camera direction (using words "zoom in," "zoom out") for the Greek vase, indicated in the first and last panels of the storyboard, in order to show the group's intentions. The checkmarks on the *Metamorphosis* storyboard panels placed the scenes in order when the students were editing the film. The written text in Row 5 is their film synopsis and reads:

> THE GOD Apollo falls in love with THE NYMPH Daphne. He chases her but she continues to reject him. At last she transforms herself into a laurel tree. But that does not prevent his love from flowering in the crown of her tree.

I am interested in analyzing how the *Metamorphosis* storyboard (Figure 8.4) represents the main filmic idea of metamorphosis, or transformation. My focus in this storyboard analysis is how the panels signify the narrative, graphic progression of transformation as shown in the figures of Daphne and Apollo. I chose the example of how the Apollo figure is depicted, because the synopsis written on the storyboard suggests an interesting intention for communicating the transformation for the Apollo figure; collated here: Apollo "falls in love" and "chases" Daphne. Daphne transforms. But that does not prevent his love from "flowering." I propose that Apollo's transformation is represented visually on the storyboard in three ways as follows:

- Apollo falling in love is indicated in Panels 4 and 5 of Row 1, with hearts that symbolize falling in love drawn above Apollo in Panel 4, and hearts in Apollo's eyes shown in the close-up in Panel 5.
- Apollo chasing is represented in Rows 2 and 3, but his body is represented in different ways, both as an outline (silhouette) and as a simple stick figure. In Panel 6 (see Figure 8.5 below for details), from Row 2 of the storyboard, Apollo's legs are doubled and he has lines streaming behind him as he chases.
- Apollo's "flowering" love is drawn in all four panels of Row 4 (in Figure 8.4). The heart icon reappears, but the heart's shape is represented with radiating lines and is placed on Apollo's chest. Apollo is subsequently shown placing a heart in the tree's crown. The heart icon in the tree has lines radiating out into the subsequent panel. In the far right panel of Row 4, the heart icon is shown along with smaller hearts to show the "flowering" in the tree crown.

Transformation occurring over time is thus represented in the changes of Apollo's actions: he falls in love—chases—and his love flowers. These actions were planned on the storyboards as events unfolding through movements in time.

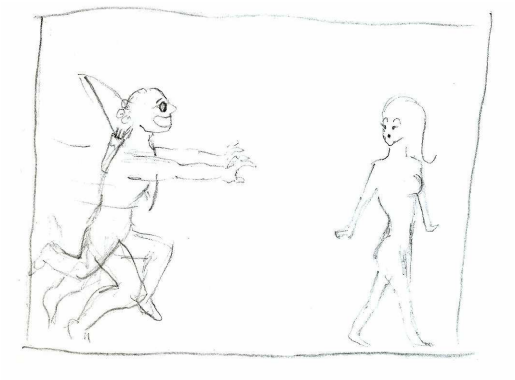


Figure 8.5 The Metamorphosis storyboard's Panel 6.

As another example of how the *Metamorphosis* storyboard visuals indicate motion over time, the visual representation of the chase in Panel 6 (Figure 8.5), is telling. The panel shows the use of a graphic convention to represent the speed of motion: the streaming lines trailing behind Apollo and the doubling of Apollo's legs to show running. Daphne is represented as walking with her head turned to gaze, back at Apollo thereby creating a vector. These graphic conventions refer to the sequential art of comics that, like a storyboard, grapples with the challenge of showing motion in a static medium. The *Metamorphosis* storyboard employs conventions for diagramming the concept of movement, the so-called *motion line* used in comic art and the streaming lines after a moving object (McCloud, 1994, p. 110).

Analysis of the *Metamorphosis* storyboard

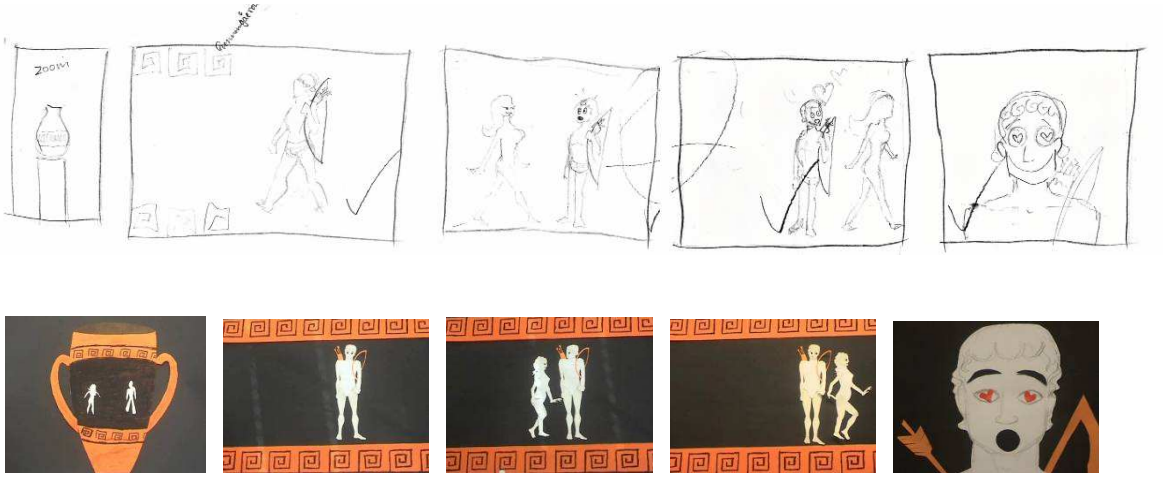
Tentatively, there are indicators of transformation as meaning *metamorphosis* on the storyboard (Figures 8.4 and 8.5), but the transformation refers to the visual mode. The mode of sound is not readily apparent on the storyboard. The intended meanings are primarily communicated visually on the storyboard. However, the use of the static, visual image is sophisticated and refers to motion and a plan for vectors (of running forward and gazing backward) in the moving images of the film.

8.1.3. How the Metamorphosis storyboard corresponds to film stills.

The following analysis concerns how the visual text of the *Metamorphosis* storyboard, corresponds with the completed *Metamorphosis* film. This comparison analyzes how closely

Metamorphosis followed the storyboard, which is discussed again in Window 3. I have rearranged the original layout of the *Metamorphosis* storyboard in order to visually compare the storyboard panels with the film stills. The sound references are described separately in a section following the visual comparison. I placed the five storyboard rows above corresponding film stills in Figure 8.6 below.

Figure 8.6A-E.
Metamorphosis' *storyboard and corresponding film stills.*



A: Row 1 (Panels 1-5) of the Metamorphosis film storyboard and film stills match closely.

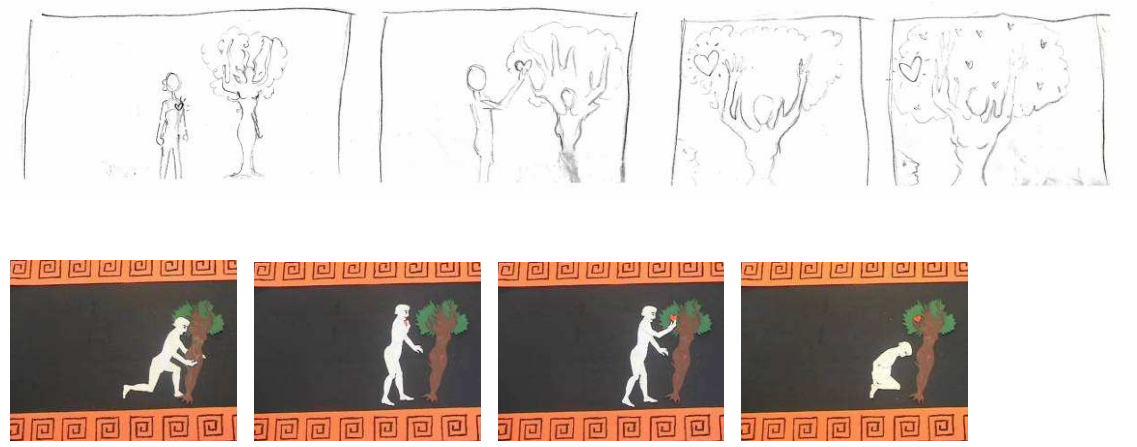
The written word "zoom" in Panel 1 refers to camera movement, while "gennemgående" (ongoing) in Panel 2 seems to refer to the Greek border in the film's middle stage.

B: Row 2 (Panels 6-9) of the Metamorphosis group's film storyboard and film stills shows two alterations. (The lack of a panel for the second scene in Paris is marked above with brackets and the stills from the film scene are placed close together to show the repeating scene.)

The film presents the scene in China first rather than the scene in Egypt as in the storyboard. The film scene in Paris appears twice in the finished film. Whether or not these alterations were intentional is unknown.

C: Row 3 (Panels 10-13) of the Metamorphosis storyboard and film stills look alike, except that the scene in China is replaced with the scene in Egypt in the film.

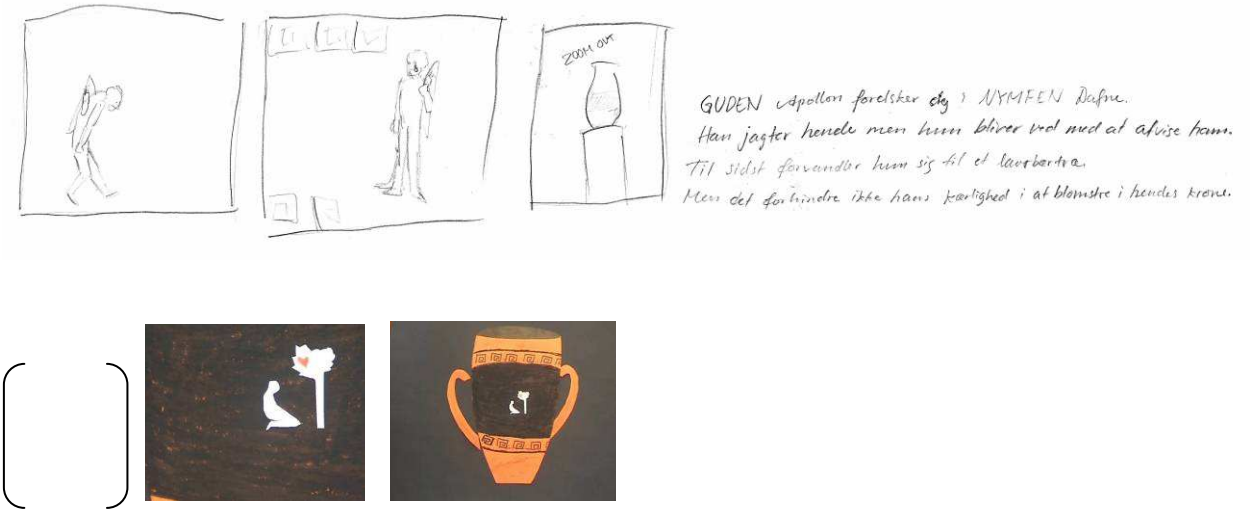
The panels in Row 3 are simply drawn with stick figures and abstract shapes. In particular, Panel 13 is open and polysemic, making it unclear how close the wavy lines correspond with the film's multicolored stars appearing in front of Daphne as she changes shape, or metamorphoses, from a nymph into a tree.



D: Row 4 (Panels 14-17) of the Metamorphosis storyboard and film stills shows several types of alterations to image cropping and camera distance.

The storyboard represents Apollo looking up to the tree with a heart drawn on his chest in Panel 14 and pinning a heart in Panel 15. In Panels 16 and 17, Apollo's face is barely visible

in the lower, left-hand corner. The panels indicate plans on the storyboard for making a half (half figure) shot of the tree crown's "flowering" hearts. In contrast, the four film stills indicate that Apollo embraces the tree, stands and takes a heart shape from his chest, pins the heart on the tree and then kneels. The distance of the camera to the subject is constant in these four film stills.



E: Row 5 (Panels 18-20) of the Metamorphosis storyboard, when compared to the film, shows major semiotic alterations that carry over from Row 4.

The storyboard shows Apollo walking with his head bowed in Panel 18. He has a tear on his cheek in Panel 19, which leads to Panel 20 with the ending shot of the vase. Panels 18 and 19 do not correspond with any film stills (which are represented by brackets). The film, at a corresponding ending stage of the narrative, represents Apollo kneeling. He is in a similar posture as the previous still by a tree with a heart in its crown. Thereby, Apollo graphically transforms or metamorphosizes into a paper silhouette on a pebbly, vase background.

In summary, Figure 8.6 shows that the storyboard corresponds, with few exceptions, to the film. The alterations made in Row 5 of the *Metamorphosis* group's storyboard in comparison to the film indicate revisions of semiotic choices, which indicate the ongoing processes of transduction and transformation. Sound is referred to with, for example, the written word "UH!" in Panel 7, which refers to a gasping sound planned in the Daphne close-up shot. This sound was heard in the rough version of the film, (discussed by students in Window 3) but this "UH" gasp was later deleted. The written word "PUF" in Panel 13 was not used in the final film, or this "PUF" may be an instruction for how to graphically depict the metamorphosis of Daphne.

Comparative analysis of the two storyboards.

Based on the above analysis, a comparison of the two storyboards (Figures 8.2 and 8.4) points to how the two groups used different means for gaining an overview of film production and their ensemble of visual and audio modes. The storyboards differ in that the *Metamorphosis* storyboard mostly refers to the narrative progression in the visual modality—showing the direction of motion and the composition of the beginning and end of the film with a vase (as analyzed in Chapter 9). In contrast, the *Out-breakers* storyboard braids together multiple modalities and indicates planning for the representation of, for example, the construction of a dynamic of audio with visuals to show shock (see Figure 8.3).

Both storyboards appear as framing the semiotic choices; how the students will produce the films in terms of shooting of images, collecting the sound and progression of the narrative. But their use of compositional means differs according to their storyboards as blueprints for transducing modes; for instance, *Metamorphosis* has graphic codes such as the border, but a plan for audio is not readily apparent. Arguably, the absence of audio references in the *Metamorphosis* group's storyboard is due to its lack in the storyboard as data or to my interpretation. This absence is further explored in the collation of the *Metamorphosis* group's storyboard to their final film (see also analysis of their presentation in the critique session in Window 3).

8.1.4. Collated findings on Window 1.

These particular storyboards (Figures 8.2 and 8.4) may not be typical of film production, as they were made in one week with a guest teacher, are very compressed, and have little written text (such as written film dialogue). The storyboards are semiotic resources that are polysemic texts (texts that have plural meanings) and are open to various interpretations. However, I believe that my limited sample and my close analysis of excerpts on storyboarding dialogues allow me to exemplify how students compose their multimodal texts in this particular context.

Findings from my analysis of the video data, the storyboards and the comparison between one film text and its storyboard indicate that storyboarding is a type of tool for thinking about and planning semiotic intent. Window 1 of data shows how the students sought to find the permeating qualities in their films and how they explored what unites form and matter. The students in the *Out-breakers* group discuss how "you" (the viewer) may read the film, and they speak of how to control the composition, or how to build a unified semiotic code through the transduction of motion, light, sound, etc. Thus, they seem to be aware of the aesthetic problem that Dewey describes, "If the percipient is aware of seams and

mechanical junctions in a work of art, it is because the substance is not controlled by a permeating quality" (Dewey, 1934, p. 199). The students are in a learning dialogue, or exercise of thinking, as they attempt to form their main filmic idea.

However, it is interesting that the students do not follow the storyboard exactly (see Figure 8.6). Thus storyboarding does *not* seem to lock down the filmmaking process, but instead may be a forum that is useful for altering semiotic choices in the phases of production and post-production. The storyboards potentially afford the *Out-breakers* and *Metamorphosis* groups an opportunity to create an outline of ideas and to sketch out how to use composition of visuals and sound to fulfill their intentions. (Consider, however, the group dynamic perspective offered in Chapter 7.)

The storyboards functioned as blueprints for the filmmaking process and the working out of the production of the film. These activities often blend, as Kress and van Leeuwen mention in regard to their concept of design and production strata (2001). These student storyboards offer, through their affordances (static representation), guidance in resolving transduction and in braiding together modalities for these students. By sketching vectors, such as gazing eyes in Panel 6 of the *Out-breakers*' storyboard (Figures 8.3), the students make a reference to how moving images use the illusion of movement. The potential of the storyboard as a tool for social interaction in the group and negotiation of semiotic intent has pedagogical implications, as discussed in Chapters 9, 12 and 13.

8.2. Window 2 on Filmmaking: Designing with the Onion Skinning Software Function

In the second Window, the focus is on exploring mainly the semiotic processes that relate to the strata of design and production (see Table 2.1) and includes the more technical challenges the students deal with in the production phase of filmmaking. Analysis is on how students in the *Metamorphosis* group discover how to use an aspect of animation production, specifically, the software function of onion skinning, which offers a particular way of visualizing animating, such as a running motion, frame by frame. My approach to practical production explores how the production processes present learning challenges for students. How do they learn to use the different types of technologies, including materials such as paper and pencils as well as digital tools such as software? How does the interplay of thinking (internal) and their actions (external) seem to relate, with respect to the notion of *mediated action* (Wertsch, 1998).

Window 2 focuses on the use of the technical tool of onion skinning in the production phase, with an aim to show examples of how students approach the technical side of mul-

timodal film production. I was fortunate to have video data of how the *Metamorphosis* group shot their single frames of animation before and after learning about the onion skinning function in the animation software (Stop Motion Pro). Onion skinning was discovered in other groups as well and appeared in the students' discourse; for example, I heard the phrase "give me onion" and the term led to the film title: *Onion Man* and Emil refers to misunderstanding it in his portrait in Chapter 7.

The term onion skinning, in review, is used to compose frame-by-frame movement. It refers to drawing on layers of semitransparent paper, like the layers of an onion, over a light source. In computer software, this same effect is achieved by making frames look semitransparent so that an animator can see the frames overlapping. The onion skinning function thus aids in seeing the transitions between neighboring, single frames in the film, the smallest level of the film (see Table 6.1). How do the students work with aligning the movements between frames? I am interested in studying how they solve this technically.

8.2.1. Window 2: Data presentation of actions.

Window 2 occurs on Day 3 at the beginning of the production phase. The data connects with data presented in Window 3 when the *Metamorphosis* group reflects on how they work out the animation of running motion. Window 2 consists of three transcripts that occur close together during Day 3. They show the following progression: Transcript 1 shows the *Metamorphosis* group before they use onion skinning, Transcript 2 shows the demonstration of onion skinning by the animation teacher and Transcript 3 shows the *Metamorphosis* group using onion skinning to position the arms and legs of the Daphne figure (see Figure 7.4 for examples of the paper shapes crafted by Anna.) Following each transcript is an analysis and collated findings.

Introduction to Window 2: Transcript 1

Window 2: Transcript 1 shows the *Metamorphosis* group using the *play* function of the software in order to see how their frame-by-frame construction of running looks when animated. Thus, the students play their captured single frames to see the single frames appear (as a series) and become moving images. The students (Anna, Celia and Meta-4) are seated at their animation workstation, shooting the single animation frames with the figure of Daphne running, with the Forbidden City in China as the background scenery. The students are working with both the physical animation setup (the paper cut-out figure) and the computer. (The computer screen cannot be seen in Transcript 1.) Anna is seen seated on the far right by the paper animation setup. Celia is seated in the middle between the physi-

cal animation setup and the computer screen. Meta-4 is seated on the left at the computer, controlling the mouse.

Window 2: Transcript 1

(Still .01. Anna is moving the legs of the figure while Celia watches. Meta-4 is looking at the computer screen. Ben is standing behind them.)
Celia *Maybe, maybe.*
(Still .03. Anna is still moving the legs, but Celia's hands reach in.)
Celia *One of the arms shouldn't be so far forward.*
(Still 0.6. Anna uses two hands to move the figure. Celia has her right hand near the figure, her left hand pointing to the figure's position as if to show Anna)
Celia *But…*
(Still 0.9. Celia and Meta-4 demonstrate the figure's arm position by moving the arms. Anna does not look up at them.)
Celia *Like this.*
(Still 0.10. Celia and Meta-4 look back down on the figure's position while Anna adjusts the figure)
Meta-4 *Like this.*
(Still 0.11. Celia and Meta-4 look at the figure's position on the screen as Anna adjusts the figure)
Celia *Yes, exactly.*
(Still 0.12. Celia looks back at the figure and lifts her hands. Meta-4 looks at the screen. Anna moves the figure.)
Meta-4 *Yes.*
(Still 0.13. Celia moves the figure with her hands. Meta-4 looks at the screen. Anna lifts her hands.)
Celia *Shouldn't it go more forward?*

Figure 8.7 (Still 0.16. Cropped). Celia adjusts Daphne's figure for the film Metamorphosis. Anna moves her hands away and points.

Meta-4 *Apollo comes in when…*
(Meta-4 gestures as if marking where the figure should appear on the screen. Note that she talks of the plan for the Apollo film figure.)
Anna *But not that far back*
(Note: Anna is apparently replying to Celia. While seated, Anna uses her own torso movements to demonstrate how the Daphne figure should move, although Anna's torso movements are not apparent due to the video camera's angle.)
Meta-4 *(unclear)*
Celia *Nooo…yes, now I am in the middle of doing.*
(Celia speaks and then turns her head as if to check how the figure looks on screen)
(Still 0.23. Anna is moving figures again as Celia looks on)
Anna *Wait a second.*
Celia *Oh, yes, OK.*
Anna *Now I have moved…*
I am doing…
Uhm…
Celia *So then you can take this…*

(Celia hands Anna a needle to work with the figures and puts it on the paper. Anna reaches to pick up the needle. Anna then bumps the paper setup.)

Anna *Oh no.*

Meta-4 *It's all happening.*

(Celia readjusts the animation background setup by pressing down the adhesive holding the paper background onto the table top.)

Celia *There.*

Yes, now we are rolling.

(Anna positions the eye of the running figure using a needle, then the full figure, then looks up at the screen)

Anna *Yes, like that.*

(Click sound, indicating that the camera shoots the frame while the students look at the screen, see Figure 8.8)

Figure 8.8 (Still 1.1). Meta-4 moves her hand (far left) to click on the mouse to shoot the frame while Celia (middle) and Anna (right) look at the computer screen. The animation background with the running Daphne figure is on the table tap.

Analysis of Window 2: Transcript 1

The multimodal interactions are messy to analyze because they entwine and overlap. My analysis involves an interpretation of their multimodal actions and intentions. For instance, at the beginning of Transcript 1, Celia looks at the screen. She and Meta-4 move their own arms as if to try out the running position of the Daphne figure, thereby shifting between the "natural" modes of embodied communication and the visual mode. They transfer the natural, body language to the obvious, visual language (see Chapter 2). When Celia says, "Shouldn't it go more forward" and adjusts the paper Daphne figure, she integrates the visual mode that is virtual (on screen) and the visual mode in the physical (paper) Daphne figures. However, the interaction order also changes between Celia, whose hands adjust Daphne's limbs, and Anna, whose hands pull away such that she gives the task to Celia. Anna comments on what Celia is doing to the physical Daphne figure when she says, "but not that far back." Anna continues to look down at the Daphne figure and at Celia's hands. Anna then demonstrates a movement while seated by moving her own body (due to the camera angle this action is not visible), and she again employs an embodied mode to demonstrate running in her communication with Celia. Anna embodies the running of the

Daphne figure and demonstrates to Celia what she means by saying "not that far back." The students are experimenting with how running *looks and feels* by embodying the running motions with their own bodies. The verbal and gestural communication is also done as part of their group cooperation on animation.

Anna later says "Wait a second" to readjust what Celia has done to the figure. Celia answers "Oh yes OK," and then Anna says, "Now I have moved… I am doing... Uhm…" Right after this, Celia says (perhaps conceding to Anna's role as leader of the group), "So then you can take this" and hands a needle (for moving the figures) to Anna. When Anna accidentally bumps the animation paper setup and says "Oh no," then Meta-4 (who looks at the screen) exclaims "It's all happening." However, Celia readjusts the paper setup and in a reassuring tone says "There… Yes, now we are rolling."

This exchange is an example of how the students negotiated internal group roles, such as when Celia and Anna share the handling of figures; this sharing is negotiated. As subtle as it may be, Anna opposes Celia taking a turn at animation and tries to reclaim her role as the animator after Celia has moved the Daphne figure.

Window 2: Transcript 2

Transcript 2 appears to show the demonstration of the onion skinning function to the group by the animation teacher. It appears only in the DVD full appendix.

Introduction to Window 2: Transcript 3

In Transcript 3 of Window 2, the video was taken from a different position behind the student chairs and captures the *Metamorphosis* group's computer screen. The onion skinning function is now switched on so that the screen image indicates the previous frame and current position of the Daphne paper figure. Therefore, the figures and hands of the students sometimes appear semitransparent. Various features within the onion skinning function are activated by the computer user (Meta-4). These features are apparent in the *mini-mode* menu of the Stop Motion Pro software, which appears at the bottom of the computer screen (see Figures 8.9 and 8.10).

Note that Meta-4 pulls a type of lever on the mini-mode menu with the mouse, which causes the figure of Daphne to appear to gradually move between positions in the frames in a smooth, animated motion. This is a sub-feature of onion skinning.

Window 2: Transcript 3

Celia	*Do you want onion skinning on?*
Anna	*Yes, I would like that.*
Anna	*Let's see what it looks like with onion skinning on that one.*
Meta-4	*Yes, on…*

Celia *What's happening?*
So, you can't see it.
Oh, it is only when you move it [Note: "It" refers to the Daphne figure]
Anna *Uhmm.*
I… she is so hunchbacked
Celia *Yes.*
Anna *Hmm.*
(Still 3.16 shows Anna's hands and the Daphne figure moving on the Metamorphosis group's computer screen. The onion skinning feature is on.)

Figure 8.9 (Still 3.45). Anna's hands and two, semi-transparent frames appear on the computer screen because the onion skinning feature is now turned on. Thereby, current and previous frames appear simultaneously on the screen.

Anna *There, now it's moving.*
Try to…
Say onion skinning on that one
(The mini-mode software menu is set to show gradual positions in frames, and the Daphne figure appears to have smooth, animated motion. Pause in the dialogue.)
Anna *OK.*
Celia *Mm.*
Anna *Mm… yes.*
Hey, that is so fun!

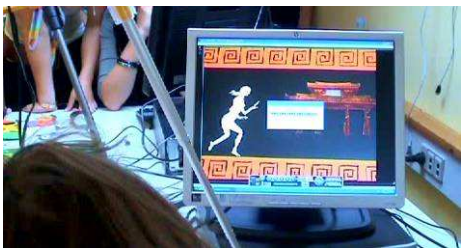


Figure 8.10 (Still 4.01). A bar on the computer screen indicates that the camera is shooting a frame, saving it and transferring the image to the Stop Motion Pro software.

(Click sound as camera shoots)
Celia *Hmm.*
Something is missing…
Anna *Hmm, yes.*
Uhm.
Then there is a question about which leg should go back first. ["leg" refers to Daphne's leg]
Celia *That one has to go down and touch the ground…*
Anna *No, that one she just touched the ground*
That one.
That's the leg that she starts with.

But she is actually just starting to move.
Meta-4 So she has to land on that one and then that one…
(Meta-4 points to the screen)

Analysis of Window 2: Transcript 3

As the group uses onion skinning in Transcript 3 to animate the figure of Daphne running, Anna comments that it is *fun*. She later says, "Now I am totally high." I assume that it is "fun" and she is "high" because onion skinning helps her to fulfill her intention to animate running. The production has been challenging, but now fun because the filmmakers can visualize how the frame-to-frame increments create the illusion of moving images. My hypothesis is that it is fun, or satisfying, to gain control of the semiotic tools and semiotic processes and it makes her "high" to learn how to apply the particular affordances of the software. The use of the onion skinning function is a tool that helps users animate what they have been trying to embody in their demonstration of running with their own bodies. Thus, they find a tool to control the timing and positioning of Daphne's limbs and a tool for thinking about the animation of motion. They may also recognize that they are using a specialist technical expertise.

I add one further example about animating running, but these data stem from the *Metamorphosis* critique session (see the full transcript appendix, Window 3). Ben talks about his use of a spread showing sequences of running that describes how to capture the momentum of running from *Cracking Animation* (Lord et al., 2004, pp. 144-145). This spread was vital for Ben in gaining a visual overview and understanding of how to produce the speed and look of running. Ben said the book enabled him to "limit the amount of frames and think ahead." I highlight Ben's comment because it exemplifies how visual presentation can relate elements in a highly complex way and how Ben gained expertise in his role as editor. So, in order to achieve aesthetic and technical aspects of the desired running effect, a visual presentation in a book afforded an overview and became a "semiotic tool" enabling thinking ahead, as Ben puts it.

8.2.2. Collated findings on Window 2.

For these students, Onion skinning has the potential to aid in what Wertsch terms a "thinking tool" for the integration of physical animation with virtual animation; the students also exemplify embodied thinking (which is usually submerged, as Scollon notes). The *Metamorphosis* group is shifting between modes while producing embodying actions (i.e., trying out running with their own bodies) and the visual mode of the (physical) paper figure that they manipulate. The group also captures this running paper figure (virtually) on screen with the use of the software. These shifts involve many modes and technologies of com-

munication as well as their interrelationships. In summary, the three students in the *Metamorphosis* group's interactions are comprised of:

1. *Shifting* between gesture, visual and verbal modalities in the interpersonal interactions in the group.
2. *Integrating* what they see on the virtual (computer screen image) and the physical (paper materiality) plane of their animation props and figures.
3. *Cooperating* with each other in their animation production as they shift and integrate modes and technologies.

These three types of interactions are co-mingled—for example in Transcript 1, where Anna rarely looks up at the screen, while in Transcript 3, Anna gazes frequently at the screen to integrate how the animation looks on the computer with the physical figure. She asks the others to use the onion skinning function, "Let's see what it looks like with onion skinning on that one." This quote indicates how Anna shifts her attention from predominantly looking at the paper figure in Transcript 1 to dividing her attention between the paper (physical) and the screen (virtual) in Transcript 3. However, Celia gazes and moves back and forth, in an attempt to integrate the virtual and physical animation processes.

Another change over time that is apparent in the video data is that group members gradually synchronize their turn-taking in moving the paper animation and employing the onion skinning software function. They take turns checking on how the frame-by-frame movement flows in the illusion of motion. Arguably, this difference may be due both to the way the students embody running and to the accumulation of experience from cooperation in the group as well as from other factors in the classroom. I point out examples of the complex, simultaneous layers of multimodal actions and the use of technologies, such as applying onion skinning to animate the Daphne figure.

The production of animation, in this Window 2, involves the three intertwined actions of shifting between modalities, integrating the virtual and the physical materiality of their animation, and cooperating in the film group. These actions are examples of the complexity of gaining experience from the use of tools and from the production of a film and how we learn and gradually submerge habits with tools. I do not intend to analytically pull apart the complexity of filmmaking, but rather to show how fluid the process of mediated actions is in regards to experiential learning. The concepts overlap theoretically with strata of design and production. My use of the term *tools* also relates to Dewey's suggestions that crafting with different media has to do with "training of aesthetic sensibilities" (Dewey, 1934, p. 355). Dewey proposes that aesthetic awareness embraces practical work with tangible, material and technical *processes* that cannot be separated from the aesthetic *form*. Some tools

help us to accomplish what we want to express, so we seek to find this type of fit as we work with and through a medium (or a technique, material or tool).

8.3. Window 3 on Filmmaking: Reflecting on Films in a Critique Session.

The third window concerns how the film groups discussed their film production processes during a classroom critique session on Day 5. These data concern what it means to reflect on media production. Reflection is a complex notion and here I refer to the combined approaches in my working model Animating Symbols and to the notions of agency from Bruner and Dewey as well as my definition of multimodal design competence (see Chapter 12) referring to Social Semiotics.

Reflection is analyzed here primarily through what the students say and embody, i.e., their verbal and gestural discourse during the critique session. I see gesture as important as an embodied mode of multimodal action and use the MDA approach with photographs of gesture (adapted from Norris, 2004). Reflection is here also considered as part of a particular classroom practice. I explore what the students *say* in the critique session as examples of critical and aesthetic inquiry and judgment, referring to the fifth feature of reflection (in Table 2.1). I focus on possible paradoxes and what the students do not or perhaps cannot articulate because they cannot externalize into words their thinking in regard to transformative work. Reflection builds over time, as Dewey suggests, and the time span captured in this case study is short. I adhere to real-time mediated actions as examples of reflection within this particular classroom session.

8.3.1. Window 3: data about film groups in the critique session.

The critique session in Window 3 took place after lunch on Day 5, the last day of the week of filmmaking. The film production phase was finished and post-production with sound editing was underway. The students' film texts had just been transferred from Stop Motion Pro to the Movie Maker program in order to edit the film frames (visuals) with the soundtracks (audio). In this critique session, all of the film groups showed and orally presented their films, which were *roughs* or *unfinished* film texts. During the session, some students raised questions for the teachers and for each other, but most of the students listened and waited to speak. Only five students actively gave feedback to other student groups. A few students were preoccupied with finishing their editing; for example, Frede was firmly told by the teachers to stop editing.

The criteria for the student presentations in the critique session were given to the students in advance by the art teacher. The students were reminded by the art teacher to account for three topics in their presentation: (1) meaning and semiotic choices in their film, (2) target audience, and (3) storyboarding in the filmmaking process. However, the presentations were not structured in terms of establishing a time frame, nor, how the students were expected to respond to one another. The art teacher explained these three topics as follows: The *meaning* was called the significance or message of the film and how the film worked formally and narratively. The *target audience* described who they were addressing with the film. The *storyboarding* included the question of whether the groups followed their storyboards. My focus in Window 3 is on the general student discourse around the given topics, with special attention to storyboarding and the alteration of semiotic choices in the *Metamorphosis* group. My aim is to supplement the perspectives on their processes of design in Windows 1 and 2.

The samples of the critique session are first, rather long excerpts from the *Metamorphosis* group's presentation and second, shorter excerpts of the *Out-breakers* group's presentation. A few excerpts from the other three film group presentations (*Horses, Onion Man* and *Spot is Mine*) are offered for the sake of comparison (see full appendix).

Introduction to Window 3: Transcripts 1 and 2, *Metamorphosis* film group

Prior to the excerpts below, the *Metamorphosis* group showed its rough film, which has multiple songs in the soundtrack. Anna is the main moderator of the group. She describes the visual design and narrative of the film. Anna talks about how the group reworked their film narrative from an ancient story: "It is the *Metamorphosis,* an ancient saga that has gone from mouth to mouth and then was written down." Anna explains they chose to design their film as if it took place on a vase: "The god Apollo falls in love with the goddess Daphne and chases her wildly, but she doesn't really want him, so she transforms herself into a laurel tree and then… we purposely only made it 2D because it is supposed to look like it takes place on a vase."

In the Transcript 1 below, Anna talks about how the group generated too many ideas for the time allotted, and about how they followed the storyboard but "simplified a little." When Anna and Ben talk about the vase, they use gestures to show their use of zoom. Transcript 2 is about the meaning of the visual and audio ensemble in their rough film. The two transcripts are presented below, followed by a collated analysis.

Window 3: Transcript 1, *Metamorphosis* film group

Anna *Well, we would have liked to have had that.*

Where he gives her his heart ["he" is the Apollo figure, "she" is the Daphne figure]
Then we would have liked
(Still 3:26. Anna moves her hand from her body to her heart and moves her hand out and in again)
(Still 3:28 Anna touches her head to show the idea that she is talking about)
(Still 3:31. Ben and Anna turn around and look at the storyboard on the wall)
Anna *him to take some branches and put them on his head.But we didn't have time for that, unfortunately…*
Actually, we didn't deviate from our storyboard at all…

Figure 8.11 (Stills 3:35 and 3:39). Ben moves his finger across Row 5 of the storyboard, Anna turns to gaze at his action. On the right, Anna points at the storyboard, moving her hand back and forth across the rows.

Anna *There are a few things that were simplified a little …*
Instead of him…

Figure 8.12 (Stills 3:47 and 3:54. Cropped). On the left, Anna and Ben both point to Row 4 of the storyboard's final scene. On the right, Anna makes a circular movement with her hand.

Anna *Thought that an ending where you only see him…*
That is the exact same picture as…
What you zoom in on in the beginning.
(Still 3:56. Anna touches her own cheek)
With a tear on his cheek.
I don't know.
Then this seemed
sort of more… easily accessible
Art teach *Yes, and I think that the other one*
would almost be with a senti…
mentality
that maybe would be,
maybe a little…
Anna *Redundant…*
Art teach *Redundant, yes, in relation to the really good last picture you have.*
Ben *If… if you noticed that*
the vase actually changed?

Figure 8.13 (Stills 4.01, 4.02, 4.03). On the left, Ben swings his hand around as if to show the vase. In the middle, Ben opens his hand and pulls it toward him. On the right, Ben quickly moves his hand outward and then back in again.

Art teach	*Precisely.*
	You also get
	the illusion
	that it is a vase…
	And I think that is very well made
Anna	*Yes, but I don't know if you notice it all from the beginning…*
	that you also zoom in the beginning

Figure 8.14 (Still 4.14). Anna swings her hands forward and moves her palms closer to show zooming in.

Art teach	*Yes, yes, precisely… so*
	the part where I…uhm.
	What kind of audience does the film relate to?
Anna	*The young and old alike.*
Ben	*Sort of Greece, ancient Greece I mean.*
Anna	*If you know the myth…*
	Then you are able to understand that
	he desires her.
	She doesn't desire him and turns into a tree.
Ben	*It relates to a somewhat older audience*
	because when you look at him, he looks
	pretty horny
Students	*(laughter)…*

Window 3: Transcript 2, *Metamorphosis* film group

Art teach	*Yes, there's one thing,*
	but it might just be me
	that's a little bit confused about your use of sound
Students	*Yes… I was also… yes*
Ben	*Don't you know your own national songs?*
Students	*(laughter)*
	Oh no… it changes.
Spot 3	*Yes, it doesn't have to do with that. It just changes like that, I guess.*
Anna	*If you notice that in the background they are running on a vase.*
	Then there is some Greek Zorba music, right,

	which is the overall theme.
	We are in ancient Greece
Art teach	*Yes, yes.*
Anna	*While they come past, uhm,*
	the Chinese temple in the background,
	it's the Chinese national anthem.
	Then when they pass the Pyramids, it's Egypt's,
	and then
	when they pass the Eiffel Tower, it's the Marseillaise
Art teach	*Yes, yes.*
Anna	*And then…*
Art teach	*Yeah, yes, yes..*
Anna	*The Star Spangled… Banner*
Art teach	*Yes, yes.*
Celia	*Yes, there's no doubt we could fine tune it.*
Anna	*We could obviously do some fine tuning,*
	and we didn't get exactly the sounds we wanted either.
	We had to take what we could get.
Anim. t	*What you might do*
	is start the Marseillaise a little bit before they come in.
	That works well when a little more of the song has played
Anna	*But it's just that they switch immediately from Cairo to…*
Art teach	*Yes, but anyway, I think that it's quite important that you do it.*
	Precisely because there are so many different songs
	it's nice to be a little prepared as an audience
	because otherwise I get really sort of very worried.
	It seems as if there is a break…
Anna	*Yes, but to put it mildly, it's damn hard to make…*
Art teach	*Yes, no doubt about that… Totally clear*

Collated analysis of Window 3: Transcripts 1 and 2, *Metamorphosis* film group

I am interested in how the *Metamorphosis* group's spoken reflections potentially relate to the practical and embodied experience of the students to the aesthetic and critical interpretation of semiotic choices. For instance, what sort of discourses are they using when being asked to think reflectively and critically about their own films? The analysis focuses on the storyboard and how the *Metamorphosis* group describes two particular alterations in the semiotic choices in their film. The two alterations are:

1. The *first alteration is on the ending* where the teary-eyed Apollo on the storyboard becomes a kneeling Apollo in the film. This choice points back to changes made on the storyboard analyzed in Window 1 on storyboarding.
2. The *second alteration* refers to the disjointing of audio and visual modes on the *Metamorphosis* rough film, discussed in the critique. The alteration of the film's audio is made after the critique.

The first alteration of the ending had already been adjusted because the group decided that the first plan on the storyboard (showing Apollo with a tear on his cheek) was what Anna

called superfluous, or redundant, in the critique session. The art teacher seems to agree that the planned representation was good to alter; she calls the use of a tear "sentimental." She praises them for integrating this alteration in the use of the zoom in and out, which Ben and Anna demonstrate enthusiastically with their arm movements (Figures 8.13 and 8.14), discussed further in 8.3.2 and 8.4.

The second alteration refers to the critique of the audio in the film by others. The ensemble of audio (with multiple national songs in *Metamorphosis*' rough film) and visual modes brings up negative responses during the critique dialogue, such as when the art teacher talked of the integration of the national songs causing her uneasiness and 3-5 students made similar comments. The *Metamorphosis* group was challenged in the critique of the audio/visual coherence in the rough film by other participants' critical judgment, pleasure and taste.

The *Metamorphosis* group argues, in Transcript 2, for their intended *meaning* of the construction of sound. Anna reiterates why the national songs were used to mark the background places (China, Egypt, etc.). Anna and Celia engage in different discourses. Celia seems to acknowledge there is a disjointedness in how and when the songs were introduced in relation to the visuals when she says, "Yes, there is no doubt that it could be fine tuned." Celia and Anna describe sound editing as difficult to do, and Anna adds, "And we didn't get exactly the sounds we wanted either."

Following the critique session, the group re-edited the soundtrack to one continuous Greek song (as discussed in Celia's portrait). Thus, the signification of the sound for the *Metamorphosis* film was altered radically. The response from teachers and students in the critique session affected the semiotic choices made in the film group.

I believe that *Metamorphosis*'s use of national themes in the rough film does need fine tuning, as Celia said, but the multiple songs add a twist of humor and complexity, and they allow for contemporary interpretations of the time and space covered by Apollo and Daphne.

In conclusion, in *Metamorphosis*'s critique presentation, Anna, Ben and Celia seemed verbally articulate when reflecting on the given topics of meaning (semiotic choices), audience, storyboarding and other filmmaking processes. The comments by the art teacher can be seen as an exercise of authority, taste and power rather than opening further for multiple perspectives in a dialogic process. I discuss this interpretation as a pedagogical issue about reflection and aesthetics at the end of Chapter 9 and in Chapter 11, which is on implications.

Introduction to Window 3: Transcripts 3 and 4, the *Out-breakers* film group

The *Out-breakers* group did not refer to their storyboard during the critique session, but instead mainly presented a problem with pacing the film. Dea says it plays too fast on Media Player. Dea is the main presenter, but Emil and Out-3 also speak, while Out-4 does not. The group introduces their film as a narrative about *school* as a prison, where school is symbolized by a pencil case, the *master* by a human hand, and the *students* by pencils who play dead but are actually alive. The group talks of how the figure of pencil Fræs changes from being represented as playing dead to coming alive. In Transcript 3 below, Dea and Emil present the meaning of the *Out-breakers* film. In Transcript 4, the group discusses how the film's meaning "relates to… transfers to all sorts of things," "symbolizes," and who the target audience is. A collated analysis follows the two transcripts.

Window 3: Transcript 3, the *Out-breakers* film group

Dea	*it's about some pencils*
	that are trapped in a pencil case and really want to get out
	Our hero is Fræs,
	who finds a hole in the pencil case or zipper where he can look
	out and tell the others that the coast is clear before
	they start to break out
	But then there are footsteps and the door opens…
Emil	*Then they all freeze except for him.*
Dea	*Yes.*
Emil	*Who then slowly creeps…*
Dea	*Yes, [Fræs] says to the others,*
	"Hurry and lay down because now the master is coming, right?"
	And he [Fræs] has had time to disappear…
	And where the hand puts down the pencils again,
	which is of course really sad because they were on their way out.
	But it is just that Fræs has run away
	down the table leg to freedom.
Emil	*And is happy about that.*
Art teach	*(laughs) Yes.*
Dea	*Yes, very, very happy…*

Window 3: Transcript 4, the *Out-breakers* film group

Dea	*Well you can say that everyone can relate to it [the film].*
	And can of course say that it is made in a childlike way,
	but the message in it can transfer to all sorts of things
	involving being caught in something where you really,
	really want to get out,
	but doing so is just enormously difficult sometime,
	whether it is yourself or another (person).
	Of course, it has a metaphoric meaning, right.
	It is of course also a very simple way of explaining it,
	but the message, I think, is quite easy to understand.
Out-3	*It's quite central that the meaning is for…*
	that we have chosen to symbolize the pencils
	that then start to come alive.

Dea	*Yes.*
Out-3	*A little like when you were little* *and imagined that things were alive like* *your teddy bears… are alive* *and take care of you… that sort of thing.* *I think it [the film] is a little childlike… it's for children.*
Emil	*And for us. (laughs)*
Out-3	*We think it's a lot of fun.*
Dea	*If you know the theme songs then it is much funnier* *than if you didn't.*

Collated analysis of Window 3: Transcripts 3 and 4, the *Out-breakers* film group

The analytic focus here is how the *Out-breakers* directly use the notion of metaphors (transfer of meaning) in their presentation of the film's message, and how their discourse refers to identity and humor. In Transcript 3, Dea uses an ironic tone when telling of the pencils being caught by the master's hand, "which is of course really sad because they were on their way out." This irony is a parody of the naïve and humorous style they have chosen for their film, but it also indicates a reflection on resemiotization across genres of satire, comedy, etc. In Transcript 4, Dea talks about the film's meaning as that of being caught and wanting to get out, and how "the message in it can transfer" and that the film has a "metaphoric meaning." The simple, naïve, childish style of the film is brought up by Out-3 as a means to convey this meaning. Out-3 talks about how the group chose to symbolize the pencils as animate or how the inanimate is imagined as alive, and she relates it to teddy bears and nurturance, "We have chosen to symbolize the pencils that then start to come alive," and she adds: "… like when you were little and imagined that things are alive...like your teddy bears are alive and take care of you."

Dea and Out-3 agree that it is a funny film. Dea refers to their adaptation of theme songs to underscore meanings, including the theme song from *Mission Impossible* and the song *Staying Alive* from the film *Saturday Night Fever*: "If you know the theme songs then it is much funnier." Dea's statements appear as a way of reflecting on the film as having metaphoric levels of meanings, or how the messages transfer. She simultaneously uses irony and seriousness. Dea attempts to verbally articulate (or reflect on) both how the film represents and how the film's message of entrapment relates to identity development, and how the humor of the film is central for carrying the serious side of the film's meaning.

The students in the *Out-breakers* group present their authorial intention of symbolizing the feeling of entrapment and coming alive. It seems that the mix of kidding around and the serious tone is used for drawing parallels to identity and psychological issues. In conclusion, Dea, Emil and Out-3 use irony in a self-reflective way in their discourse.

8.3.2. Collated findings on Window 3.

Window 3 offers data from a type of staged reflecting about experiences of altering representation that are still in progress in the classroom. This is quite different than reflecting back on the experiences (as in Chapter 7 portraits), referring to Schon's distinction of reflecting on action or in action (1987).

My analytic interest lies in how the students communicate about their films and reflect using verbal, visual, audial and embodied modes. I find this gesturing is significant in Window 3, as well as the practical, hands-on experiences of composition, exemplified in the storyboarding and onion skinning activities. Ben and Anna especially employ gesturing to point to their use of the visual storyboard, to demonstrate their use of the circular vase figure and the zooming movement (embodying camera-initiated movement, see Figures 8.13 and 8.14). Anna also gestured to re-enact the actions and movements of the figure of Apollo giving his heart away in the film. After Ben pointed to their storyboard, Anna pointed to the storyboard as if to underline how they followed the storyboard's plan closely during film production (in Figures 8.11 and 8.12). This kind of pointing out may seem banal, but is central to communication, yet so commonplace that it may be easy to overlook. But the use of obvious and natural language is important for understanding designing and reflecting as multimodal actions (the body and the visual as obvious and natural language is discussed in Chapter 3).

8.4. Summing up the Main Analytic Points

In these three windows, I try to build a nexus of analysis across the filmmaking phases in the classroom. My analytic handle on filmmaking is the exploration of how the students design, compose (especially) and resemiotize. I focus on what I can see and hear the students saying, drawing, gesturing and acting out in the classroom or how they are communicating multimodally about their semiotic choices in the films.

I find that the video data indicate group activities well. The data in Chapter 7 helps to distinguish individual and group dynamics. I cannot go into all of the layers of the many diverse, simultaneous actions, but I can select a small circumference around multimodal actions. Linguist Sigrid Norris uses the term *modal density* (Norris, 2004a) to describe such multilayered, multimodal interactions. Group interactions were very dense; the content of conversation consisted of overlapping remarks about composing the film, various questions and shifting verbalizations of film intentions. Given this density, as a reporter and researcher, I selected a few strands of multimodality in the data to indicate filmmaking.

The underlying research questions related to design as an active, multimodal participation in filmmaking and thereby, reinventing language. The density of the actions in the video data led me to inquire into how the students used their bodies and materials aesthetically when composing their multimodal texts.

My analysis of the three windows suggests that filmmaking as a semiotic process highlights three particular aspects.

1. Transducing modes in storyboarding as a forum for composing a multimodal ensemble (as a transformation or resemiotization process). Group interactions were influenced by roles and some students appeared to have a more decisive influence on making semiotic choices.
2. Using gestural, visual, verbal and audio modes of communication. This is central to filmmaking actions, such as the running poses embodied by the *Metamorphosis* students to visualize running motion, and how the *Out-breakers* students spoke and drew audio modes on their storyboard.
3. Reflecting was specifically shown in the critique session as this brought up dialogues and articulations of semiotic choices. The students discussed authorial intentions in their multimodal texts and referred to their past experiences of reception. However, reflecting is seen as an ongoing aspect of transducing and multimodal communication.

In the synthesis below, I reiterate that the multilayered multimodal interaction is dense and open to multiple interpretations. Yet, I believe that I have found some indicators of transformation in how the students worked with composition and resemiotization of multimodal resources during filmmaking and how they are reflecting on their experiences.

The film groups are transforming semiotic sources and building their own semiotic codes in multimodal text composition. The experience gives the students an opportunity to become agents that interact with both the physical and psychological aspects of human tools for communication (Wertsch, 1998). However, the students struggled to realize meanings. They face aesthetic challenges in composing their text, which included negotiating the social dynamics of groups and the technical processes involved in making the film.

Filmmaking involved the students in various multimodal actions while brainstorming (speech, gesture, multimodal sign-making) such as when they created the storyboards and resemiotized sources in the animated films. The storyboard served as a sequential platform for inscription of the temporal aspects of the moving images. Motion was created through the combination of the individual images. In the storyboard panels, images indicate duration movement and serve as a blueprint for keeping all the film levels working together:

the scenes and stages, etc. It also orders the film down to its smallest unit, shooting of the film text frame by frame. Individual, still images are combined into a moving image sequence. This combination is later aided by the onion skinning function of the software program.

Composition as an action is aided by using the storyboard as a type of blueprint device for planning. This use is evident in how students have storyboards placed at their workstations and how frequently they referred to them during the production process.

Throughout the week, I observed the groups engaging in multimodal composition and confronting aesthetic and technical issues. Social, group conflicts emerged somewhat along gender lines. My findings point to the importance of the technology of the physicality of materials, such as how paper used for making the storyboards is tangible material (Sellen & Harper, 2002).

As reviewed in Chapters 2 and 4, the students' reflections are part of a cumulative process of learning. However, I can only capture the external actions. Analysis of the films in Chapter 9 shows how the films are composed in three narrative stages and how they mix references across materials, styles and historical time. This chapter has clarified the fact that students were instructed to use the three act model and were advised to consider adapting old stories and to make storyboards. Arguably, the compositional stages and levels used to construct the films were influenced by the instruction (see Chapter 9).

Chapter 8 data indicates resemiotization in, for example, the *Out-breakers* film group referring to prior experiences of viewing films when they composed their multimodal ensembles. They were highly active in discussing how to transform ideas across modes to the film's composition and were able to reflect on their message and personally connect the film's themes to identity issues, such as breaking free from school. During the critique session, the *Metamorphosis* film group said that they intended to use the ambiguous circular reading of the vase as a narrative, compositional device. The group reflected on identity issues of transformation based on Ovid's two thousand-year-old story, *Metamorphosis*. Chapters 7 and 8 established that the student films referred to texts and applied narrative structures from a wealth of types of texts. Their references and experiences are explored further in Chapter 9.

In Chapter 12, there are conclusions about the many coinciding technical, aesthetic and social interactions that occurred during animated film filmmaking and a presentation of an empirically driven profile of competence across three aspects: cultural, creative and reflective.

9. Animated Films: Analysis of Texts

Chapter 9 is the final of three chapters in which I present data. This chapter has two parts: (1) *film analysis* and (2) *synthesis* of data and considerations of pedagogy.

The formal analysis presents two animated films, one fine-grained analysis of *Metamorphosis* and a broad analysis of *Out-breakers*, along with a mention of the other three films from the week-long workshop. The analysis is based on a social semiotic analysis of the composition and incorporates an iconographic approach to the contents (symbolic representation) of the film texts.

The synthesis brings together data from all three components (filmmakers, filmmaking, and films). This leads to a review of the teaching practices and conclusions about the pedagogical potential, with a focus on storyboarding.

The methodological framework and methods of film analysis as laid out in Chapter 5 and 6 are applied here. Film analysis addresses the interrelation of the formal composition and resemiotization (re-mix) of various multimodal types of texts in the animated films by the students. It also summarizes the strategies used in the films to realize the metafunctions of communication.

In Chapter 7, the interest was on how the individual filmmakers articulated discourses about the arts and media and how they presented themselves. In Chapter 8, the interest was on how the students interacted and made semiotic choices during their filmmaking processes in the context of school. While in Chapter 9, the interest is on the analysis of the outcome of filmmaking, asking questions of *what* is the result in terms of a multimodal text composition, and *what* meanings does such a film text carry? All of the above questions are seen as related to answering the main research question of how the students are designing and reflecting in relation to their transformation of texts.

I offer here a review of my terminology in this chapter with regard to: *transformation, figure* or *character,* and *shots*.

Transformation is used in various ways. In regards to the film *Metamorphosis*, the filmic idea refers to transformation as in metamorphosis in relation to the film's figures graphically shifting form (or shape). This could also be called *morphing*, as when a human shifts to becoming a tree. Transformation also refers to the overall narrative theme of metamorphosis as being about transformation. However, transformation is still my theoretical term for the double process of designing and reflecting, and I see the above uses of how forms change and narratives show changes as specific instances of the notion of transforming texts.

Figure and *character* are terms that I use as follows. Figure usually refers to the concrete, paper figure that the students are designing (such as Daphne). While character refers mainly in a literary sense to who is interacting in the narrative. But the two uses overlap and blur, and my usage is not distinctive.

Types of *shot* refers to film terms, including camera-initiated and subject-oriented, as used in Chapter 8 analysis and presented in Chapter 3.

9.1. Film Text Analysis

The descriptions of the final animated texts present a form-oriented social semiotic approach to the analysis of composition with some use of iconographic methods. The analysis considers how these examples of animated texts use particular semiotic systems and a modal status (truth value) referring to the fantastic.

The presentation begins with the formal, *compositional* description and application of tables based on Iedema's analysis of multimodality and levels of a film, based on the three tables shown in Chapter 6. The formal qualities of the *Metamorphosis* film text is analyzed in detail, followed by a formal analysis of *Out-breakers* in less detail. Then the two films are compared as to their form and subject (i.e., thematic content). The film text analysis refers also to *resemiotization*. It clarifies the inter-textuality of references to other texts, including the redesign in the *Metamorphosis* film text, which includes the use a Greek vase as a semiotic resource, which I term *design code*. The vase is traced back to how the students find a particular vase depicted on the British Museum's Web site (Figure 9.2).

9.1.1. Multimodality and levels in the *Metamorphosis* film text.

In order to provide an overview of the structuring of the modes and levels of *Metamorphosis*, I start with the presentation of two tables. They show my analysis of how the meanings are composed in the film using the combination of *modes* for the ensemble, and using levels that structure the film. These two tables are followed by film descriptions.

Table 9.1 presents how the different modalities are used in *Metamorphosis*. It clarifies the choices of using different semiotic resources in the ensemble of modes to represent the filmic idea of metamorphosis.

Table 9.1

Multimodality of the* Metamorphosis *film text

Multimodality of *Metamorphosis* film text	
Modality	**Description of modes**
Visual: still image	Composition of frame shows characters in front of objects (buildings). The design mixes conventions of ancient Greek form language, with style, texture and color of decorated ceramics . Flat figures are cutouts; buildings are hand-colored photos.
Visual: moving	Compositional elements relate to each other in time by shifting distance to viewer, initiated by camera position at beginning and end. Dynamic space between film text subject positions (characters) varies during middle.
Sound: ambient	No ambient or voice used.
Sound: music	Musical score is national melody (Greek folk music), continuous.
Words and numbers	Re-semiotizes written systems of alphabet and graphic representation of space from sources; Ovid´s Metamorphosis and conventions of 2D drawings of figures `moving´ on 3D surface of Greek vases, 2D maps/3D globes, and 2D/3D animation film art.

Table 9.2 shows how the film levels construct meaning in the *Metamorphosis* film. It is an overview of how the film levels are composed. For instance, a primary design code used is a Greek vase for separating the three stages of beginning, middle and end in the film, as mentioned under level 5, Generic stage.

Table 9.2

The* Metamorphosis *film text: analysis of levels

Metamorphosis film text: Analysis of levels	
Level	**Description of the level**
1 Still image	There are circa 1700 single frames to acheive length of 1 minute 11 seconds. Cut-out technique used on all frames.
2 Shot	Shots used both camera-initiated and subject-initiated movements. Change of distance occurs in f.ex. inserted close-ups of faces that are reacting or `reaction shots´.
3 Scene	Total of 12 scenes in the whole film: 2 scenes are camera-initiated in beginning and end, 10 are subject-initiated.
4 Sequences	Sequences in the middle stage are made up of scenes where characters are moving across multiple time-spaces. Sequences show specific characters (Apollo and Daphne) in a chase travelling across multiple historical times and geographic spaces.
5 Generic stage	Three Stages. Beginning is zoom in on vase - Middle is chase - End is zoom out to full view of vase. Boundaries are designated by devices of changing design codes and driven by a narrative progression.
6 Whole to narrative	The film employs convention of three acts and Greek myth as narrative. The graphic style alludes to modern times and modern buildings, using a naive style of stop motion animation cutouts to create an artistic style. The wholeness is a collage that re-semiotizes old and new narratives.

9.1.2. *Metamorphosis* film description with stills.

The analysis proceeds with a detailed description of the film levels (Figure 9.1). It is organized according to the three film stages of the *Metamorphosis* film text. The description is illustrated with the film stills that guided me in creating the tables and conducting the collated analysis. I placed the description here in order to give indicators to back up my claim about the complexity of each of the single elements making up the composition of this film, where especially each visual unit is highly complex as a pictographic mode (such as discussed in Chapter 3).

First, a synopsis of *Metamorphosis*:

- Duration: 1 min, 11 seconds
- Narrative: this short animated film is the students' interpretation of the epic poem *Metamorphosis* (Ovid, 2000/ original 8), which consists of roughly 250 classic Greek myths or tales, written by the Roman Ovid around 8 CE. In Greek mythology, the nymph Daphne personifies the laurel tree. She was the beautiful daughter of a river god and lived a pastoral existence and rejected all suitors. When the god Apollo, bewitched by Eros, pursued her, she prayed to be transformed into a laurel. Apollo took laurel leaves to weave garlands, a symbol still used today for prizes.
- Technique: stop-motion animated film, collage of cut-out paper
- Soundtrack: Greek national theme, continuous
- Stages: the animated film is composed of three distinct stages with various rhythms and graphic elements. The beginning is comprised of the title shot of a Greek vase; the camera zooms in on the vase. The middle stage shows the characters meeting and giving chase to one another. This chase continues for most of the middle stage. The middle stage culminates with a transformation (metamorphosis) of the characters. The ending shows the Greek vase once again and the camera zooms out.

The stages and scenes are described in Figure 9.1.

Figure 9.1 (A-Q).
Stills from* Metamorphosis *organized in stages, scenes and shots.

The Beginning Stage

A: Beginning, Scene 1.1. Static title shot.

The title *Metamorfose* (*Metamorphosis*) is shown in green hand-made lettering with the ornamentation of laurel leaves in the shape of a laurel wreath.

B: Beginning, Scene 1.2. First scene: second shot of the Greek vase.

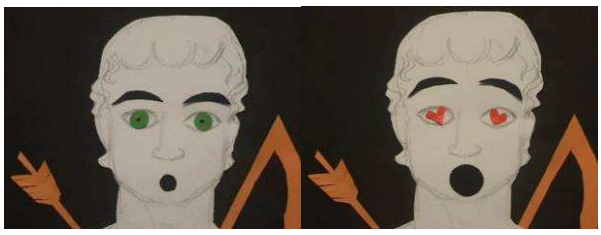
After the title screen, the film opens with an image of a flat Greek vase with only the top visible. The black background appears to be empty. The vase has orange handles and the top and bottom of the vase have Greek-style ornamentation bordering a central frieze. Two flat white figures are placed on a roughly textured background in the frieze area of the vase. The camera zooms in on the center of the frame, which is also the center of the frieze. The camera moves closer to the two silhouetted figures on the vase. The figures are distinguishable as male and female. On the left, a woman with shoulder length hair and a profile of a round breast is represented (Daphne figure). On the right is a broad shouldered man (Apollo figure). The bodies do not appear to have defined feet or hands.

The Middle Stage

C: Middle, Scene 1.1. First chase scene: first shot.

The shot starts with a white figure (representing the god Apollo) holding a bow and carrying some arrows over his shoulder. The Apollo figure has a muscular, youthful body with no apparent clothes or genitalia but instead is a silhouette with eyes and drawn hair. The figure is made out of cutout paper; flat shapes and shadows reveal the paper material and how the body is made up of pieces for the head, limbs, torso and feet. The figure has more detail than in the Beginning Stage.

In the first scene, Apollo stands alone, facing forward and shifting his weight between his legs. Then, another white figure appears from the left (representing the nymph Daphne). The Daphne figure has a shapely young female body shown in profile but is a silhouette with no apparent clothes or genitalia. Daphne is shown from a side view and enters from the viewer's left and walks toward the center of the frame. Apollo turns his head to look at her, which creates an inter-subjective vector with Daphne. However, she does not return his gaze in this first meeting. It is a one-way vector.



D: Middle, Scene 1.2. First chase scene: second shot.

Apollo is shown in a reaction shot that shows his full face. He looks directly into the camera. His eyebrows go up and his eyes blink. His eyes turn from round, green irises to red hearts while his mouth grows from a small to a large circle. These signs commonly represent surprise, love.

E: Middle, Scene 1.3. First chase scene: third shot.

The third shot resumes the distance used in the first chase scene, but Daphne has already passed by Apollo and exits to the right. Apollo swivels and follows her, dropping his bow and arrows slowly on the ground. At the same slow pace as Daphne, he exits right. His bow and arrows are left behind on the otherwise empty background. The exit of both figures ends the first chase scene.

F: Middle, Scene 2.1. The second chase scene: first shot.

Daphne appears alone from the left and moves right. Daphne turns her head, looking behind her, as Apollo appears from the left. Then they both run faster to the right until they reach the center of the frame.

G: Middle, Scene 2.2. The second chase scene: second shot.

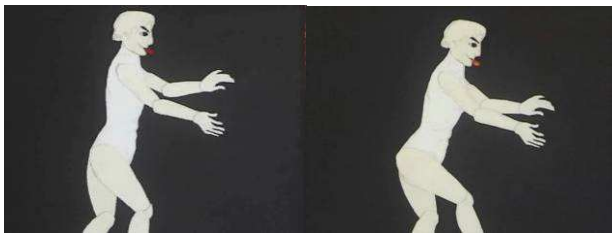
The second shot uses a close-up reaction shot of Daphne's face, showing her lifting her eyebrows and opening her mouth to represent a look of worry, surprise or fear. Her face is white with pencil lines for its features, but the lips are noticeably different; they are a solid, deep red color with white highlights as if she were wearing lipstick. The lips and large eyes represent innocence, glamour and sexiness.

H: Middle, Scene 2.3. The second chase scene: third shot.

The third shot resumes the distance used in the second chase scene. Daphne still turns her head to look behind her, but then faces forward when Apollo appears and chases her. The two figures run. Apollo draws closer to her in pursuit. Daphne exits to the right, and the shot and scene end with Apollo running after her.

I: Middle, Scene 3.1. Third chase scene: first shot.

The background shows a temple, the Forbidden City in China. Daphne enters the scene from the left. She looks back, toward left, as she is running right and the shot ends.



J: Middle, Scene 3.2. Third chase scene: second shot.

Close half shots of Apollo are inserted into the third round of chasing. The closer view of Apollo shows a red tongue hanging out of his mouth as he runs right. He appears more sexual and threatening.

K: Middle, Scene 3.3. Third chase scene: third shot.

The third shot resumes the Chinese setting and distance. Daphne still has her head turned in this scene, looking left and running right. Apollo quickly appears, running in pursuit of Daphne past the Chinese temple.

L: Middle, Scene 4. Fourth chase scene. No inserted shots (shown here with three stills).

A background showing the Pyramids in Egypt opens the scene. Then, Daphne runs in from the left with Apollo close behind her at the left, still in pursuit. The fourth round of chasing ends with Apollo running and exiting to the right.

M: Middle, Scenes 5 and 6. Fifth and sixth chase scenes are identical, showing Eiffel Tower in Paris. No inserted shots (shown here with three stills).

A background showing the Eiffel Tower opens the scene. Daphne runs in from the left and turns her head fully to look directly behind her. Apollo appears with his tongue hanging out, and the chase continues with Apollo exiting on the right. As this scene appears twice, it looks as if the figures are circling the Eiffel Tower.

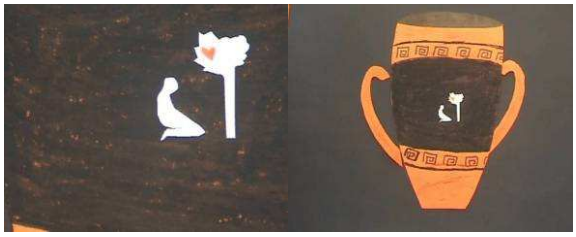
N: Middle, Scene 7. Seventh chase scene. No inserted shots (shown here using three stills).

A background showing the Statue of Liberty in New York opens the scene. The figures are shown in half shots: Daphne runs in first from the left and then Apollo follows, exiting right. He is leaning over, indicating his running speed.

O: Middle, Scene 8. Eighth chase has no inserted shots (the scene is shown with eight stills).

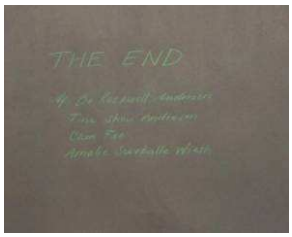
The figures are now shown in full shot with the camera at greater distance (full shot). The structural, graphic compositional device of the ornamentation of the Greek vase returns. Daphne runs in first, on the opening frame of Scene 8, but she steps up and begins to metamorphosize. The metamorphosis begins after Daphne raises her arms over her head. Apollo runs in while Daphne raises her arms and he watches her metamorphosis. As she changes, star shapes emerge and explode over her. Then Daphne's female body appears again, now superimposed onto the shape of a laurel tree. Apollo then gently embraces the tree, he picks his heart as if plucking it out of his body and pins it onto the tree. He then kneels by the tree and the scene slowly ends.

The Ending Stage



P: Ending, Scene 1.1 One scene showing Apollo kneeling by the tree on the vase.

The vase is shown with the same roughly textured background as in the beginning stage. The shapes are now Apollo and a heart drawn on a tree, which are placed in the same upper right corner as in the last frame of the middle stage. The camera zooms out so that the Greek vase appears in full view, the reverse direction of zoom as the one used at the first stage of the film. The film narrative ends on this scene.



Q: Ending, Scene 1.2 Still shot: THE END with credits (closes film).

9.1.3. Analysis of composition.

My analysis of composition of text refers largely to how the film is structured (or framed) as *film levels* and uses particular compositional devices to make up the spatial and temporal structures (see Kress & van Leeuwen, 2006). The particular use of the graphic Greek vase as a graphic design code is of primary interest for analysis; of secondary interest is how movement is shown (referring to Figure 9.1).

The composition of the film, using the Greek vase as a particular design code, aids in the overall composition. The beginning, middle and end stages in the *Metamorphosis* film text are clearly defined and differentiated using *three main compositional devices* as follows.

1. *Graphical elements*, such as color and surface texture of the Greek vase mark stages. Movement patterns (camera-initiated or subject-initiated movement) are also used to mark stages in the film.
2. *Tempo*, which is rapid in the middle stage and slower in the beginning and end of the film.
3. *Space*, which has the illusion of various, circular patterns and forms.

Below is an elaboration of the three compositional devices with reference to the use of the vase and movement as a central analytic thread.

The *graphical elements* signify Greek vases, including the color scheme used throughout the film to hold the story together. The beginning and ending stages are similar in surface texture and camera movement. The materiality of Greek vase texture was given a hand-drawn roughness representing a ceramic, worn surface of an ancient Greek vase. The figures in the beginning and end stages look like two-dimensional figures drawn on the Greek vase. Crayon was used to create a rough surface texture in the beginning and end stages of the vase image in order to achieve an expressive quality that contrasts with the flat look of the running, cutout figures. This graphical change of texture of the vase may be subtle, but it helps to distinguish the still vase from the middle part of the film. The graphic style in the middle is different: running figures made out of many, separate cutout forms (limbs, torso and heads in different positions), which are put together to show running movement (see the example of the hands in Figure 7.4).

The use of movement patterns contributes to building a unique code made up of the figures (subjects) and the camera in the three stages of the film (see Figure 9.1):

The beginning stage: The figures are still, i.e., not moving, in the beginning (and end). The camera-initiated movement (zoom in) makes the viewer attentive to the framing of the vase and especially to the central part of the vase.

The middle stage: The figures become animated; they walk, run, explode and kneel, etc. The figures are represented using various distances and viewpoints: full, half, and close-up. There are two close-up reaction shots that show great detail of faces and small, slow expressions. The figures move in response to one another; at first, Daphne does not return Apollo's gaze, but she starts to look back at him over her shoulder. There is a strong two-way vector of gazing (left to right and right to left) and a running movement (from left to

right) in the chase sequences. The figures start within an ornamental vase border, but they leave the border and run past stationary monuments. Daphne returns to the vase and transforms (or metamorphosizes) into a tree. The tempo of Apollo and Daphne's movement varies: at first, the running figures have a dreamy movement pattern, as if the figures are floating, then the speed increases just before Daphne transforms. The rhythm of the composition was used to build suspense until the culmination (crescendo) of the metamorphosis of Daphne into a laurel tree. The tempo then slows down up to the representation of another metamorphosis or resolution: that of Apollo becoming a gentle man who kneels and places a heart on Daphne (the laurel tree) as a gesture of devotion.

The ending stage: The figure of Apollo is alone with the tree and heart, not moving, as in the beginning. The camera-initiated movement (zoom out) again makes the viewer attentive to the framing of the vase. When the characters transform at the end, the quick pace of the chase slows as Daphne explodes and becomes a static tree, and as Apollo slows and kneels at the film's end.

Tempo in the film is another key compositional device that signifies the separate stages of the film. Tempo varies, marking the chase and how it crescendos just before the slower transformations of the characters. The composition of tempo relates to the illusion of space. Together, they create a unique code for opening a polysemic representation of conjunction and disjunction of historical time and geographic space. The composition of the *Metamorphosis* film text relies on a graphical foregrounding of the characters, and the illusion of movement, whether the characters are running or being still. The work as a whole involves the ambiguity of how a viewer interprets the scenery, or semiotic signifiers of the architecture depicted behind the characters in the story. However, the characters do not react to the changing scenery, but to each other while the chase continues at an increasingly rapid pace in the middle stage. The design of the scenery thus displays another layer of meaning in the story for the viewer. The various time and space combinations unite the readings of, for example, the chase sequences. The viewer reads (or decodes) the different types of movement in the chase scenes as a sequence about a long journey. But the chase is represented with primary salience, it draws attention.

Space is a compositional device used to create a circular path and refers to the viewer's recognition of geography and architectural landmarks. The monuments seen in the background of the film text refer to landmarks in China, Egypt, France and the USA (the Forbidden City, the Eiffel Tower, the Pyramids and the Statue of Liberty). The path of this journey can be interpreted in two ways: across time, and/or around the globe in a journey that spans time and place. This double interpretation is achieved because the figures run past well-known monuments around the globe from very different historical time periods.

This travel route between the geographic spaces and historical periods adds another level to the journey or chase, as the span of historical time between the landmarks constructed in China, Egypt, France and the USA is not shown. The viewer constructs, or fills in, the geographical places between the depicted background scenery. The continuous soundtrack underlines the sense of a journey through time and space from ancient to modern Greece. The film text uses spatiality and three-dimensionality to create an illusion that the running movement of the figures unrolls. This is polysemic in that it can be read as if both figures are moving forward by running to the right, and/or the figures moving around themselves on a vase. This illusion complements the Greek vase, a round object; the viewer can pretend to walk around the vase to read the actions in a sequence, or the viewer can pretend to turn the vase around to read the sequence.

Thus, the film is composed with a unique design code based on the Greek vase, but also incorporating known visual codes (such as the Eiffel Tower) and various filmic storytelling techniques (such as camera zooms) to make the viewer interpret the place and spatiality in the film.

Summing up the composition, the film analysis shows a reliance on a multilayered use of the visual mode. The graphical elements carry the meaning of the *Metamorphosis* film. The continuous soundtrack can function as underlining the sense of a journey through time and space from ancient to modern Greece. Consider again what the students reflect on in Chapter 8, that they intend to communicate the filmic idea of metamorphosis but they have difficulty with the composition of the soundtrack.

The *three main compositional devices* of (1) graphical elements, (2) tempo, and (3) space are used to create a circular journey through time and space in the *Metamorphosis* film. Only at the end of the film text can a viewer interpret the connection of the zooming in on the vase at the start with zooming out on the vase in the end.

The viewer may or may not be read the chase scenes in the middle as if they took place on a round object, or may be surprised when realizing this polysemiosis in the composition of circularity. The multiplicity of the film text's layers of meanings is achieved through its composition using the Greek vase. To me, this is an example of the power of visual stories to represent in an abstract and timeless way, the kind of shared cultural narratives that Bruner discusses. The graphical elements carry the thematic meanings of the *Metamorphosis* film.

9.1.4. Analysis of resemiotization: mixing multiple art and literary sources.

This analysis focuses primarily on interpreting selected instances of (1) *how* signs and symbols alter across modes, or transduction (Kress, 2003). Secondarily, I analyze resemiotization is terms of (2) *why* these particular semiotic sources are selected and their impact on design, but this is secondary here because the authorial intention was already discussed in Chapter 8. The synthesis in Chapter 9 returns to review both areas.

As mentioned, the iconographic and nexus analysis methods I use include gathering background on the changing meanings of signs in a modified *diachronic description*, in this case tracing a few references used by students for their animated film *Metamorphosis.* I offer examples of how it refers to: (1) *ancient Greek myths*, (2) *architectural landmarks*, and (3) *ancient Greek vases*.

The ancient Greek myth is the epic poem *Metamorphosis* (Ovid, 2000/ original 8), which is the students' source for the narrative (as reviewed in Window 3 of Chapter 8 and my film synopsis in 9.1.2). The *Metamorphosis* film resemiotized various sources from antiquity, including: the literary source of Greek myth and the art historical source of a vase. Thereby, the Greek myth became resemiotized in the content of the *Metamorphosis* film text by integrating literary, architectural and art history references. This invention was intended by the filmmakers, as analyzed in Chapters 7 and 8.

The *architectural landmarks* in the film text allow for the interpretation of the film as a timeline (and relates to using the Greek vase as a design code). The design code of the vase integrates the film narrative with various historical architectural sites appearing in the film's background. The architectural landmarks represent a wide range of civilizations across time and geographic space:

- The Forbidden City, built in 1406-1420 CE in Beijing, China.
- The Pyramids, first built ca. 2575 BCE at Giza, Egypt.
- The Eiffel Tower, built in 1889 CE in Paris, France.
- The Statue of Liberty, built in 1874-1884 CE, erected in 1886 in New York City, USA

The film's timeline was created from the unique combination of the above historical sources that make reference to historical time. The film also has layers of space achieved through the representation of circular forms, both the earth as a globe, and the Greek vase's round shape.

The ancient Greek vase represented in the *Metamorphosis* film text specifically refers to the so-called red-figure Attic style developed around 530 BCE in Athens that spread through Greece, Italy and surroundings areas during the fourth century BCE (Williams, 1985). Vase is a generic term; the type of vase depicted in the film text is probably a neck amphora, which is made up of the following components: neck, bands of ornamentation and frieze(s), base. The red-figure vases are typically highly ornamental and have scenes painted in earthy colors as friezes. The scenes on the vases depict actions with flat, but detailed, areas. The actions painted on Greek vases can signify a range of events, for instance, war battles, game competitions, tragic or comic plays, mythic dramas, as well as everyday activities (Ibid.).

However, contemporary viewers may be familiar with a Greek vase that has been photographed (thereby transduced into a two-dimensional image) as well as being familiar with the original, 3D physical vase seen on exhibit in a museum. The *Metamorphosis* film group downloaded a photographed, i.e., two-dimensional image of a vase that depicted a scene with the characters Apollo and Daphne. This particular image (below) from a vase image was downloaded from the British Museum's Web site (http://www.britishmuseum.org/) by the students during the pre-production phase of filmmaking. The vase was made by an unknown artist about 2,500 years ago (unknown, 450 BCE).

Figure 9.2 The saga Metamorphosis depicted on an Attic-style Greek vase. The image was downloaded by the students from the British Museum's Web site.

The narrative theme of the animated film is a chase or flight from unrequited love or rape (confirmed by the filmmakers, see Chapter 8). The character Daphne's transformation into a laurel tree can be read as an escape from rape, a metamorphosis of shape and a death. Their twist on the theme is thereby to redesign a very old mythic story about the eternal conflicts of love and desire (the dark side of Apollo's obsession with Daphne) while also presenting a lighter side of the story.

The chase is resemiotized from the literary form to moving images. Again, the use of vectors shows the interrelationship between the characters by using gestures; the arms of Apollo are stretched out as he runs, as if he is trying to catch Daphne. The hands and arms of Daphne gesture to try to stop Apollo's pursuit. The story ends with an explosion and a sense of lightheartedness, shown graphically at a slower tempo with Apollo and the tree in the upper right corner of the film frame.

9.1.5. The Metamorphosis film text: summary of the analysis.

The representation of the temporal and circular spatial dimensions plays with the notion of movement as well as other factors of perception, technology and the history of moving images. The film refers to the perception of movement that animation employs to create the illusion of 3D space on a two-dimensional material (i.e., the film screen). The running figures seem, to the viewer, to stand in place, but they also seem to be running in a circular path. The use of the round vase as a compositional device creates an ambiguity concerning what moves and what does not. This use of flat and round surfaces builds on contemporary knowledge of two-dimensional and 3D mapping and the reading of round images, such as those of globes and vases.

The film uses the Greek vase's border ornamentation as a semiotic code that anchors the film location to a vase. Note that the border is not used when the figures are in China, Egypt, France and the USA; thus, the locations and monuments weave various meanings together with the Greek vase. The *Metamorphosis* film uses the vase graphical code in combination with modern filmic conventions of a road movie. Here I move to a universal level of meaning when I associate the journey represented in *Metamorphosis* with another film where the heroines hit the road and attempt to escape rape until they die, namely *Thelma and Louise* (1991, American road movie).

9.1.6. Functions of communication in the Metamorphosis film.

The functions below refer to Table 9.3, which offers a summary of analysis of how the film communicates using Halliday's three levels.

Representational: The film is about transformation. Each frame uses vectors that show a dynamic relationship between the figures of Apollo and Daphne. The chase theme is represented as a chase over a long span of historical time and geographic places (space).

Orientational: The film text enacts an interpersonal connection by employing two directions and types of gazes: Apollo gazes forward in a lustful way while Daphne looks over her shoulder in fear at Apollo. The tempo of their movements crescendo and the distance is

shortened between the subjects in the middle stage. The movement pattern creates the social organization of the relationship between the subjects: one is chasing the other. But the interpersonal positions change. Daphne turns into a tree and Apollo symbolically gives his heart to Daphne's tree as a sign of devotion.

Organizational: The film text constructs levels and uses roundness to organize the story temporally and to make the universal love theme work. The roundness of the vase functions semiotically to show motion and the passage of time and space. It also sets up multiple ambiguous interpretations of the film text. This resemiotization process involves a transfer from a circular shape (the vase) to the animated film's two dimensions, which offers the illusion of 3D space.

9.2. The Out-breakers Film: A Brief Analysis

A shorter, formal, compositional description of the *Out-breakers* film is presented in the following section. The presentation begins with the formal, *compositional* description and application of tables, also based on Iedema's analysis of multimodality and levels of a film. The film analysis of *Out-breakers* also refers to *resemiotization*, providing a few examples of the inter-textuality of references. The table below presents a condensed analysis of how the different modalities are used in *Out-breakers*. I refer to inter-textuality as well here; the ideational intent of the *Out-breakers* students and their discussions during storyboarding are presented at length in Chapter 8 and their portraits of Dea and Emil. (My analysis was based on film stills; see folder 1 of the full appendix: *Out-breakers film analysis*.)

Table 9.3

Multimodality of the* Out-breakers *film text

Multimodality of the *Outbreakers* film text	
Modality	**Description of modes**
Visual: still image	Composition of still uses design mix of conventions, e.g., *Soup Opera* animation collage with strong lighting effects. The graphic design integrates real objects, human arm and paper. The main actors are pencils with eyes of paper.
Visual: moving	The pencils as compositional elements hold attention. The camera is active, shifting distance to viewer, following pencils down the table leg at end. The dynamic space between pencil characters varies.
Sound: ambient	Ambient sounds of typing, door, footsteps. Only voice is laughter.
Sound: music	Musical score uses popular songs in muzac version, including: *Mission Impossible, Pink Panther, Staying Alive* song from *Saturday Night Fever*
Words and numbers	Re-semiotizes written systems of alphabet and typing one letter at a time for title and credits. Has extensive credits with animation of characters.
Multimodal	Audio represents the narrative, such as *Staying Alive* song to accompany visual of pencil escaping. In ensemble of audiovisual modes, the audio is central.

9.2.1. The Out-breakers film text: analysis of the composition and resemiotization.

My analysis picks up on the same three main compositional devices applied earlier to the *Metamorphosis* film. Again, I consider the use of *three main compositional devices* of (1) graphical elements, (2) tempo, and (3) space. A fourth element for analysis is how sound was used as a semiotic resource and compares the *Out-breakers* film's application of compositional devices, as well as form and subject with *Metamorphosis*.

There was a clearly differentiated graphic design code of the vase used in the *Metamorphosis* film for marking stages. But the beginning, middle and end stages in the *Out-breakers* film are generally not as defined, see collated analysis below.

1. *Graphical elements* of style, color, lighting, textures and movement patterns (camera-initiated or subject-initiated movement) do not differ markedly between film stages of *Out-breakers.*
2. *Tempo* is rapid throughout the *Out-breakers* film, but changes direction from a horizontal to a vertical movement.
3. *Space* is set up with pencil figures moving about in a representation of the physical, 3D space of a table top. So, the depicted truth value of the animation modality pertains to a more physical, "realistic" illusion of space wherein pencils move.

In addition to the three devices above, the analysis considers audio as a fourth compositional device.

4. *Sound* as a narrative device serves to compose the film's stages. The unique use of the code of songs helps the viewer read levels and meanings in the *Out-breakers* film.

The *graphical elements* have a naïve or innocent style, because the film materials are a humorously used mix of collage and pixilation that refer to human actors and objects associated with childhood (such as make-believe of pencils as having eyes). The main characters in the *Out-breakers* film are a group of chewed-on pencils with eyes made of paper that seem to wink, blink and roll, which create an effect of absurdity. The naïve visual style and soundtrack show the film as a humorous, ironic spoof about the escape of one trapped pencil from among a group of other pencils from a pencil case. This pencil is named Fræs in the credits (and called a hero by the group members). The film takes place within a space

that appears as a stage with a worn school table, a red reading lamp, and pencils. The pencils appear as if moving like puppets on a stage, which is a table top.

The film adapts its graphic style and characters' names from the *Tractor Tom* series of children's books and animated shorts (referring to a character: *Helten Fræs, Hero Rev* in English). The *Out-breakers* group was inspired by the short animated films of *Soup Opera*, made by the French company of Marlou Films and broadcast on Danish children's television (Barrier & Clémençon, 1991, 2000) as mentioned by Dea in the interview (see Chapter 7). The pencil characters in the *Out-breakers* film are shown below on the left and right in Figure 9.3. This is compared with a still from the *Soup Opera* series to illustrate the similar use of space, color and a mix of collage elements in a naïve visual style.

Figure 9.3. Stills from Out-breakers and Soup Opera animated films. On the left: a close-up photo of the pencils from Out-breakers. In the middle: a close-up of a character from Soup Opera, a frog made out of fruit. On the right: a still from Out-breakers showing the pencils on the table top.

The *tempo* of *Out-breakers* is fast overall, especially when the main pencil figure is represented in a frantic rush to escape alive, moving horizontally in the beginning and middle stages. There is both subject-initiated and camera-initiated movement; the camera follows the main character, a pencil who escapes downward along the table leg (the students call this pencil "he," our hero, or Fræs) in the ending stage.

Sound as a mode is foregrounded in the film through the use of a fast-paced and complex soundtrack. The *Out-breakers* film alludes to events by using audio to represent something going on off camera, such as footsteps and a door creaking signifies a door. Thus, the use of ambient sound represents the image of "door" and "person walking" in the mind of the interpreter. The nearness of the human in the film is indicated by sounds of footsteps and a door shutting, and the group of pencils react to the sound by falling down on the table, thereby looking like they are dead. (This use of songs refers to similar films, like *Toy Story* and *Muppets*, which were mentioned by Emil in Chapter 7 as having "ingenious songs.") The song "Staying Alive" becomes a theme song in *Out-breakers* and it stems from the film

Saturday Night Fever (1977 film with music by Bee Gees). *Out-breakers* uses a gleeful-sounding laughter at the end of the film that accompanies the pencil as he smiles and apparently escapes. The film as an animated text represents the fantastic, underlined by sound as well as graphic representation mixing the real table and animated pencils with eyes, achieving an overall effect of the absurd.

9.3. Comparison of the Metamorphosis and Out-breakers Films

The two films draw differently on the four compositional devices, as follows.

1. *Graphical elements* of color, lighting and camera movement constructed a complex code in both films. *Metamorphosis* played with the ambiguity of two-dimensional and 3D design as a narrative device.
2. *Tempo* is used for effect in both films, although the *Metamorphosis* film showed tempo visually while the *Out-breakers* film shows tempo visually and through audio.
3. *Space* is elaborately constructed in both films, interweaving polysemic graphics in the background with figures moving through time and space.
4. *Sound* is a dominant narrative element that structures the *Out-breakers* film, but in the *Metamorphosis* film, one song plays continuously in the background.

The content of both films represents a theme of transformation by showing a main conflict and resolution in three stages. The film narratives take place, however, in very different storyworlds, or settings, for the story. The *Metamorphosis* chases signify the attempt by the heroine (or protagonist), to escape from an antagonist, the oppressor. Both films share the use of a strong character, who is identifiable as a protagonist. In the *Out-breakers* film, the pencil called Fræs represents a school student. In the *Metamorphosis* film, the nymph Daphne represents innocent nature and virginity. Both films also share the use of an antagonist. In the *Out-breakers* film, the human hand (called the Master of the school by the student filmmakers), makes the pencils react and turn into just pencils, and controls the pencils by putting them back in the pencil case. In the *Metamorphosis* film, the antagonist is Apollo, but this softens. The escape of Daphne may refer not just to avoiding rape, but also to a pursuit of freedom and this can be likened to the pencil Fræs pursuing freedom.

The references to the ancient world in *Metamorphosis* is open to interpretation of the idea of escaping contemporary times, as Daphne and Apollo run past the ancient (the Egyptian Pyramids) and modern world (symbolized by the Eiffel Tower and the Statue of Liberty),

but return to the Greek vase. The ancient Greek culture represents our cultural birthplace. We share practices, such as art, music, dance, theater, storytelling, worship, debate and sports. The nymph Daphne symbolizes the quiet, pastoral life and love of nature. The semiotic choice of Daphne symbolizes the struggle to establish an identity in a fast-paced world by going back to our birthplace, to nature, and to Greek civilization with its classic mythology.

In the *Out-breakers* film, the pencil Fræs escapes and runs away from imprisonment down the table leg. Fræs laughs gleefully at the end, looking directly into the camera, as if addressing the omniscient viewer, then disappears off-screen. He is free at the end, but his future is unknown. With a big mouth and voice at the end, Fræs is shown as more *animated* or metaphorically appears to become more alive. Fræs represents a rebel and, if the metaphor is taken further, he runs off-screen to symbolically find a new identity, as seems indicated by the song "Staying Alive," about another young film character trying to find his place in the world.

Continuing the analysis of the metafunctions of communication, Table 9.4 below summarizes my points of analysis on composition and resemiotization. The table compares how the two films express themes of escape and the search for identity.

Table 9.4

Comparison of the* Metamorphosis *and* Out-breakers *films

Aspects of the films	***Metamorphosis***	***Out-breakers***
Narrative theme (conflict)	Escape rape	Escape school
Setting	Global journey	Table and pencil case
Protagonist / Antagonist	Daphne vs. Apollon	Pencil Fræs vs. Master
Movement pattern	Figures chase: walk or run	In and out of pencil case
Resolution of conflict	Daphne turns into tree	Pencil Fræs gets away
Use of space	Left to right yet circular path	Up and downwards
Style reference	Grecian urn	Collage (Soup Opera)
Color scheme	Earthy, warm	Black and red/golden
Technique	Cut-out animation	Pixellation and puppet
Materials	Paper, drawings, prints	Found objects and human

9.4. Summary of All Five Films

This summary focuses on the thematic contents of all five films, which are seen here as being *cultural narratives* and referring to identity issues. (See full appendix folder 1 for films and analysis of all films.) The three overlapping thematic conflicts represented in the films can be read as: the search for love, the escape from domination and the danger of annihilation.

- *Love* includes romantic longing *(Horses)* and unrequited desire *(Metamorphosis)*
- *Escape* involves breaking out from a prison-like school *(Out-breakers)* or being chased until death *(Metamorphosis)*
- *Danger of annihilation* involves war *(The Spot Is Mine)* or invasion of the body *(The Onion Man)*

The characters in the student films represent heroes and heroines who confront various types of threats to their integrity. The students were instructed to consider making a plot with conflicts between antagonist and protagonist and to construct a three stage film with plot twists by the animation teacher. The particular conflicts and plots were developed by the students. They dramatized conflicts using symbolic meanings of violence, sexuality, institutional slavery, social isolation, bodily invasion and total destruction.

Three of the film heroes overcome threats by the end of the film.

- In *Metamorphosis*, the heroine Daphne refuses Apollo's sexual advances. By transforming into a tree, she saves her integrity. Apollo is redeemed by her actions.
- In *Out-breakers*, the hero Fræs escapes from his dead identity in school. After that, Fræs receives a mouth and can laugh as he runs away to freedom.
- In *Horses*, the hero is an isolated male horse named Brandon. He finally finds a mate and can be happy in their Garden of Eden.

Two of the film heroes do not overcome threats by the end of the film.

- In *Onion Man*, the hero is a man invaded by teddy bear candies. The man, the victim, dies; thus, the candies and the pear win.
- In *The Spot Is Mine*, the hero is the innocent yellow man caught in the middle of a nonsensical war between two soldiers. The world, as a result of the war, is destroyed.

In summary, all five films are composed with strong use of design codes of various types. They use different materials and ways of organizing stages. All films draw on extracting and mixing layers of meaning in their multimodal texts. The use of irony is strong in all films except *Metamorphosis*. Overall, there is a use of composition of an ensemble that uses a grammar of satire and the films draw on what I call the mode of animation, which refers to its special techniques for representing fantasy, the surreal and the absurd.

The final summary below collates the two main film texts, *Metamorphosis* and *Out-breakers*, based on the Hallidayan metafunctions of communication adapted to film analysis (refer to Table 6.3). The metafunctions of communication are the way the films represent their sto-

ryworlds and are oriented toward the viewer. Consider how these animated texts by the students draw on the special affordances of animation. The films use a juxtaposition of audio and visual meanings and codes that refer to the fantastic and the surreal, such as how they use space. For example, *Metamorphosis* is a serious, dreamy and romantic type of film, while *Out-breakers* is a surreal, satirical film.

The metafunctions are summarized as follows:

Representational: The films show threats to integrity and the transformation of identity within the characters, whether or not they overcame or succumbed to the threat.

Orientational: the movement patterns enact subject relationships internally and externally in the text; in the *Metamorphosis* film, the characters Daphne and Apollo have a strong dynamic, but are also shown gazing directly at the viewer in reaction close-ups. In the *Out-breakers* film, the pencil Fræs leads other pencils, but also faces the viewer and winks and laughs directly at the camera.

Organizational: the film texts are composed with an ensemble of audio and visual modes, but they achieve their communication with the viewer with different types of codes, for example, by reusing familiar songs or a Greek vase.

9.5. Synthesis of the Data Analysis

In the following synthesis of data, I return to the main research question and pull together the analytic strands about how these particular students are designing and reflecting on their texts. My argument is that when designing their own texts, they are thereby reflecting on various texts. They are thus involved in a double process of transformation—both the internal thinking process and the external process of authoring multimodal texts.

Designing the texts has been studied as an active, hands-on process, a social action (referring to Meditated Discourse Analysis). Actions are seen as occurring in a real-time unit and in a site that offers a nexus of social actions. This case study has three components of data: the filmmakers' experience, the filmmaking including the interaction order in the groups and the films. All three components are seen as related to discourses in the arts, the popular mass media texts in our culture and to school.

Below, I provide a short synthesis of the findings in regards to how the students are designing and reflecting. The synthesis refers to the following three areas: *identity exploration, interpretation as a dialogic process* and *trying out semiotic tools.* I delve further into each area after the synthesis.

1. The students engaged in a process of *identity exploration* in relation to self and culture. This accompanies the symbolic representation of ideas and reflection upon how to represent these ideas in a multimodal film text. This exploration included combining references to historical time periods and the resemiotization of meanings across modes.

2. The filmmaking study showed *interpretation as a dialogic process.* This interpretation is also referred to as a two-way, reflective learning process that is inquiry-based, referring to the pragmatic learning by doing of Dewey (presented in Figure 1.1 as the model Animating Symbols*)*. They are some indications that they gain some critical awareness of the construction of meanings of signs and symbols in their everyday life and their increasingly visual culture. As students selected multiple modes of representation to compose their films as multimodal ensembles, they also reflected upon how an audience might receive their films (the orientational function).

3. Trying filmmaking in school involved *trying out various semiotic tools* and mediated actions. This concept of actions with various tools refers to Social Semiotics, especially strata of design and production as well as the notions of how people use physical/virtual and psychological/cognitive tools (Wertsch, 1998). (See Figure 2.1, which shows that the internal and external understanding of tools *overlap* and interact in a dynamic tension.) The opportunity to gain experience with digital (and physical) tools in film production is a process of experimentation; trying out tools for thinking. It involves steps toward adopting new ways of embodiment and thinking with tools. The filmmaking process potentially stimulated an interest in using digital tools for realizing not only film, but also creating other multimodal productions in other contexts. This aspect especially impacts students with high interest in the arts but with less ICT (information and communication technology) experience, especially young women.

9.5.1. Cultural identity, personal agency and resemiotization.

Below is an elaboration of the exploration of identity, followed by the topic of resemiotization. Identity was a recurring theme in the data across the portraits, the films and the filmmaking group interactions. The students in my case study can be seen as undergoing their own inner process of transformation, which relates to two concepts: their design process of choosing external signs *and* the particular filmic ideas or themes chosen in the films that refer to transformation of the self. The film texts are semiotic expressions that were selected and constructed to show themes of inner transformation in the sense of metaphors of per-

sonal and cultural identity. The narratives are driven by how the heroes, such as the hero pencil in the *Out-breakers,* who faces adversity, overcomes conflict and escapes.

The *Out-breakers* and *Metamorphosis* represent threats to integrity and the transformation of the main characters, whether they overcame or succumbed to the threats. The films *resemiotize* codes and mix sources to create layers of meaning, such as in the combination of the classic Greek vase and the many historical buildings in the *Metamorphosis* group's film. The juxtaposition of the songs (such as "Staying Alive" from *Saturday Night Fever*) and the visuals (such as *Soup Opera* animation shorts shown on children's TV (Barrier & Clémençon, 1991, 2000) was created in the *Out-breakers* film. The use of humor and irony is strong in each film, but the meanings are also serious and the students themselves interpreted their intentions in their films as both meant to be fun and serious, as the critique session showed. Dea refers to humor and resemiotization in the critique session: "It is funnier if you know the references." Emil says in his interview that he loves *Shrek*, which is noteworthy because the *Shrek* films are made with virtual animation and the films resemiotize, or use many inter-texual references, such as to old fairy tales, in the same way that the *Outbreakers* film does.

This use of many inter-textual references and irony can be interpreted only by those who are culturally competent to read them, people who are able to retrieve and associate meanings from the multitude of codes and layers of meanings intended by the filmmakers. In the case of *Out-breakers,* some meanings may be known from seeing for example, *Soup Opera*. The resemiotization used in the two main film texts was confirmed as intentional by the interviews and the photos in the portraits. The five students also spoke of having a great interest in history and mass media, such as Ben and Emil, with their interest in older historical periods serving as a way to understand the new. Ben talked of knowing your past and compared the *Iliad* to modern ads about sex. Emil is interested in art and architecture from the past (Ephesus), has read *The Song of Troy* numerous times and was a guild leader in *WoW*. These activities may not seem remarkable since the students are in a college preparatory line of upper secondary school and have chosen social sciences and humanities curricula, but it is striking how they blend sources. In their last year of high school, the students are leaving home and confronting decisions that affect their future education and career. They are also preparing for the next phase of life, their adult identity. The students are searching for meaning and testing identities—at the age of 18, they are doing intensive work to complete 12-13 years of schooling, to graduate and become free. They face becoming adults in a globalized world and are orienting themselves toward this adult identity. They are transitioning from being students to the cusp of adulthood. Defining themselves

is the backdrop for the portraits and is the intensive task that the students are in the midst of and that they articulate in various ways.

9.5.2. The film production roles in relation to experience.

Power was associated with the positioning with computing in Ben's account, but Dea and Emil also referred to being able to be in the lead as instructors and to solve technical aspects of filmmaking. They referred to the role of technical and/or artistic leadership as giving powerful positions in the group interaction order. I have selected these issues of power to understand the positions and conflicts within the groups. Group members took different positions of power internally; the groups differed somewhat within a range of egalitarian leadership (to use Emil's term) to having one strong leader. The more egalitarian group interaction order of the two main groups appeared to be the *Out-breakers* group, and the group with one more dominant leader was the *Metamorphosis* group. One example of gaining influence is perhaps the "footing" Ben speaks of when he chooses to gain power by taking a techie role rather than be an outsider. He decides to enter fully into the filmmaking group process and can see that Anna needs technical help to achieve her artistic vision. Anna expressed a desire to have full artistic control over animating figures and took leadership in the interview and she is the main speaker during the critique session. Her leadership was *supported* by Ben as techie and editor. Anna confirmed this help by calling it a partnership.

Celia expressed some frustration with not getting to edit. This occurrence leads me to question the power issues in the group social interactions in relation to my research question about engagement. Perhaps the sense of satisfaction that the students expressed about engaging in the activities of filmmaking had something to do with their roles. Two main questions arise: how do students gain power, and how do the filmmaking roles correlate to satisfaction with positions of more or less power? Consider that both Out-4 and Meta-4 appear to have had little influence in the two groups. A pedagogical concern about filmmaking is therefore about teamwork and how it may be cementing the pre-existing hierarchies among students.

But, the students were conscious of which filmmaking roles were most important and they appeared to strive toward being instructors and techies. Their strivings led to my ranking of the filmmaking roles from top to bottom in Table 7.1. Below, I discuss various views on the hierarchies of articulation and interpretation that I observed in the classroom.

The perceived hierarchies in filmmaking practices may exemplify shifting views in professional practice: "Whether the producer or the director is at the top of this hierarchy de-

pends on the context, with traditional Hollywood practices favoring the producer, and European art film the director" (Kress & van Leeuwen, 2001, p. 43). Kress and Leeuwen contrast the producer and the film director as historically possessing the highest status, but they point out that the emerging area of multimedia production is different because new digital practices are favoring the development of competencies in multiple skills that are defined as a complex practice. Therefore, they suggest that there is an aggregation of skills (and hierarchies) shifting toward an integrated practice in the making of digital multimedia. This practice may be integrating in some situations. I found, however, that the roles were a negotiation of power in this classroom context. Roles in filmmaking were differentiated in a construction of hierarchies similar to "European art film the director" (Ibid.). I suggest a correlation between a student's satisfaction with his or her role in the group and with his or her commitment to the project.

The positions of the students correlate to the winners and losers that Heise describes in her studies of how students cope with upper secondary school (discussed in Chapter 4). The students faced the interpretation of a complex of identities: the world at large, the school and their identities and their classmates' identities. Dea described this complex of identities in her portrait. The notion of winners and losers can assist in understanding their identity-related work in this phase of their life. This notion appears, in this case study, in the theme of the *Out-breakers* film. The identity of a loser and a winner is represented in Anna's drawing of the class with the sign that reads WINNER and by her story about transforming their image as school losers.

Being a winner in the film groups appears to relate to position—finding a powerful role or a way of getting footing. Position has to do with displaying expertise in a role, as observed in filmmaking, portraits, and as discussed in the group collations. In the animated film filmmaking groups, the winners were the students who took leadership roles. The portraits suggest that students positioned each other and admired each others' talents. Ben admired Anna for her artistic talent. This admiration and positioning can be due to a number of social factors, such as the group size. Social collaboration was thus skewed and the dynamic in the creative activities favored leaders who were perceived as winners and could garner what Ben (and Henrik) described as power.

9.5.3. Discussion about designing as reinventing language.

The filmmaking data capture how the students invent through their resemiotizing or transforming of meanings when they compose their own multimodal ensemble. This interplay of texts is anchored in the student practices of mixing by cutting and pasting from digital archives for their film productions, for example, in the resemiotization of the Greek vase

from the British Museum (Figure 9.2). Other examples of transforming meanings include Ovid's saga on *Metamorphosis*, the reproduction of architectural wonders, the stylistic influence of *Soup Opera* and the songs for films, as reviewed. Why do particular multimodal texts leave strong impressions and become resemiotized? Such a question could have led to an interesting discussion in the classroom. For instance, why were the *Soup Opera* animations, broadcast around 2001, remembered by the *Out-breakers* group and how were the other students able to recognize the reference?

This has rich pedagogical potential. The animated films were an isolated subject in school, but could have been a springboard for exploring how we build concepts and epistemologies and how we continually transform meanings. A rich exploration in the classroom might have been how designing a multimodal ensemble draws upon resemiotization, using a comparison of how the *Out-breakers* versus the *Metamorphosis* films use music to develop their story. Pedagogical discussions continue in Chapter 9.6 and in Chapter 13.

9.5.4. Discussion about designing in relation to production.

Designing as a semiotic process appears to relate strongly to technical production, including trying out various tools to realize filmic ideas. This is discussed further here as it relates to gender and to notions of embodied experience. As analyzed in Window 2 of Chapter 8, the three female students in the *Metamorphosis* group crossed between the physical and virtual animation practices by shifting from the embodiment of actions (creating running motions with their own bodies) to the (physical) paper figure that they were moving to create the illusion of a running figure, which was captured with software and displayed (virtually) on a computer screen. Their production process of animation thus involved three intertwined actions of shifting, integrating the virtual and the physical materiality of their animation, and cooperating in the film group.

This embodied approach to tools is apparent in the Window 2 data on onion skinning—the *Metamorphosis* group tried out running motions with their own bodies. Anna exclaimed that it was fun to see the film's motion on screen and she seemed to realize how the onion skinning feature afforded better control of animating the running motion from frame to frame. Trying out tools is exemplified by Wertsch, for example, with a pole vaulter adapting movements to a pole with different qualities in what Wertsch calls an irreducible tension (Wertsch, 1998). Technologies can bias and change our behavior so that we develop habits and perceptions of use and expectations through the interplay between thought processes and bodily actions. Gender and technology are interrelated with our personal, bodily and practical experience and our social environment, which together impact our perception of tools. Vygotsky argues that semiotic tools cannot be separated from semiotic

expressions (Vygotsky, 1978). Dewey writes that form and matter are inseparable. However, all of our mediated resources for semiotic expression, our tools, materials and technologies, have specific qualities and affordances (Gibson, 1979; Norman, 1999).

The students approached digital technologies differently according to gender, which seemed to be part of the tool–person tension, but may also be entangled with identity and culturally marked notions and perceptions. The students know and act using technologies from everyday life, such as paper, pencil and software. They used various semiotic resources, such as storyboards, to communicate. Affordances allow for different types of actions; for example, the paper storyboard that hung on the wall afforded the *Metamorphosis* group an overview of the filmmaking process. Presumably, the *Metamorphosis* group readily understood how to storyboard because the creation of one was familiar and the animation teacher told them it looked "like a comic," but onion skinning was unfamiliar and these students needed a demonstration by the teacher. Affordances are thus a matter of what is perceived, i.e., subject to our expectations and experiences with particular tools.

The portraits show that editing brought up *conflicts* in the *Metamorphosis* group. Ben adopted the role of the "technical guy" in the *Metamorphosis* group and articulated, in the interview, that he gained power. (An observation from this classroom: the class had only four males, but they took the computer-oriented lead role in three out of four mixed-gender filmmaking groups. *The Spot Is Mine* was the only all female group and seemed to be the most egalitarian in its evenly distributed sharing of computer tasks.) In the *Out-breakers* group, however, Dea took the lead but shared the artistic and technical responsibilities with Emil.

In this case study, reported personal experiences and preferences with ICT varied according to gender. The young women in my sample (except for Dea) have less experience with computers but what interests me is that their involvement was potentially high. Celia (and Gina from the *Horses* group) expressed curiosity and interest in editing with the computer and were frustrated because they did not get a chance to learn how to use it. What keeps them from getting access to the computers? Is it due to the social pressure to stick to their filmmaking roles in their groups? My hypothesis is that they did not *get* footing because the four young men, and Dea as the only woman, *took* the roles of technical expert and thereby, gained power in the editing roles. Although Ben edited on the computer, he was in partnership with Anna, who was the artistic leader. Thus, Celia (and Gina) gained much interest in editing with the software tools, as when Celia tingled with eagerness to edit, but they gained little practical experience with the computerized aspects of the animated film filmmaking during this week.

However, Anna indicates a different attitude toward tools. She makes detailed and skilled drawings (Figure 7.3), such as when she made the cut-outs of the hands of Daphne in the *Metamorphosis* group's film (Figure 7.4). Anna reported that she thinks better with her hands and that she still writes drafts by hand before typing on the computer. Skilled in drawing, Anna has chosen not to adapt to computers. I assume that she focuses on the loss of her drawing skill and style and her increase in frustration in relation to digital tools, rather than any potential gains in using the affordances of digital tools.

Differences in behavior and preferences toward computers are well documented and point out that, in general, males have higher computer self-efficacy, more positive attitudes towards computers, and greater computer experience than females (Keogh et al., 2000) (see literature review in Chapter 1). A gender preference regarding the use of technologies or tools continues. There are some indications of a gender digital divide among these humanities-oriented students, who were age 18 in 2005. But there was apparently an *increase* of interest among the young women in only one week, as indicated in this study. This increase raises questions for how arts and ICT can be integrated pedagogically, as this may hold potential for developing positive experiences and attitudes towards computing. I return to this idea and discuss the implications in Chapter 13.

9.5.5. Discussion about reflecting as a dialogic process.

Considered a dialogic process because it is two-way, interpretation is an overlapping and continuous process of reflection as an aspect of learning. I presented a model for the transformation of inner and outer sign and symbol-making, an active process of animating symbols. This transformative process is related to developing the competence to critically reflect on texts as a continual and iterative process of dialogic interpretation and to the triadic relationship of self to others and signs (Figure 4.1).

I propose that these dialogic processes are about *animating or bringing to life* symbols that relate to learning and identity development. A semiotic authoring process potentially challenges identity-oriented issues, since an author expresses or externalizes inner metaphors of meaning and inner experiences. The processes of working with symbols can offer a forum for reflection about self and society. A dialogic process is a two-way process that includes various practices of interpretation, such as talking about a text or making a formal text analysis (Burn & Durran, 2007, pp. 19-20). The idea of a dialogic process of interpretation when working simultaneously with production and theory-building can also be termed dialectic, recursive or as thought in action (Kimbell et al., 1996, p. 24).

My model Animating Symbols is meant to convey a key point of the pragmatist tradition: you cannot do critical learning until you do active learning. The model is an attempt at addressing my underlying research questions—*what* students reflected upon and *how*—in regard to the experience of making the animated film and the connection with other visual texts. I sought to discover how reflection about media and art experiences outside of school might relate to a school activity, such as the filmmaking in this case study. The photo-elicitation interviews were also a dialogic process, where interviewees have a dialogue with me in considering how media texts are designed to represent meanings, such as when Emil discussed the election campaigns as a "media cavalcade" (see Figure 7.6).

The critique session and the photo-elicitation interviews allowed me to talk directly about how the students interpret and reflect on the arts and mass media and various texts. But I view the students' two-way dialogic process as occurring throughout the phases of film-making during the week, as exemplified in the three windows of data in Chapter 8 (and as a lifelong process). My point is that the students could not have arrived at their explications in the critique session (Window 3) without having the ongoing dialogic interpretation of reflection during the week. For instance, the storyboarding process appeared to give them opportunities to engage in dialogic processes, such as when Dea and Ben discussed whether or not to use the sound effect or use light to represent meaning (in Window 1). Storyboarding also served as a blueprint for transducing or transforming meanings across modes and for making alterations along the way.

The students in my case study brought together, or resemiotized, content from a wide range of sources of inspiration when they composed their films. All five film groups seemed to be actively involved in the activities; however, some students were less active and some had less influence, or footing, in their groups. In the interviews, the students mentioned a wide exposure to media and seemed quite discerning about taste, genre and the source of news. They seem to know what they like and why. However, my contact with the less self-reflexive students or the "losers" group by Heise, raises a concern that this kind of student stands to gain much from the iterative, dialogic process of reflective learn-ing. See discussions below and in Chapters 12 and 13.

9.6. Pedagogical Perspectives

My pedagogical perspectives revolve around selected pedagogical practices and issues that seemed *problematic* based on the video data, observations and themes derived from the student and teacher. I also highlight the potential for learning but my concern is with the hindrances to learning for this type of classroom filmmaking activity. This description is

not an evaluation of the specific teachers or school, but an exemplification of how ICT and instruction fit into a school and can bring up problems and potentials. What follows is a discussion of:

1. *Clashing practices* of teachers and students in the school context
2. *Instruction* about animation and digital technologies
3. *Integration of reflection* in the flow of instruction during the week of filmmaking

The filmmaking pedagogy is discussed here in order to contextualize the experiences of the students. Teachers and technologies as practices within the school are reviewed, followed by examples of evaluation by the teachers, the students and my observations.

As a final pedagogical perspective in this chapter, I consider the potential of integrating storyboarding in filmmaking instruction.

9.6.1. Clashing teaching practices.

In my view, there were three different, clashing practices that coincided within the classroom; the two teachers brought in two different pedagogical practices, while the students brought in their set of practices from experiences with the arts and digital media consumption and production, etc. These three practices are reviewed after an introduction to the teachers.

Both teachers can be characterized as enthusiastic, but each brought differing traditions, roles and practices to this classroom. The animation teacher was responsible for teaching how to animate and she focused on the value of craftsmanship. Storyboarding is integral to the model of instruction that the animation teacher utilizes in her practice at the Center for Animation Pedagogics (The Animation Workshop, 2007). She is experienced teacher with establishing short-term animation production but she usually teaches younger children and up to about 10th grade level. She used the format of a lecture to present concepts of animation where she stood in front of the class and showed film clips. The animation teacher also led discussion of how films are constructed and wrote on the blackboard (see description in the appendix). The art teacher discussed the integration of animation into the subject of art and into art theory. She knew the students already. She is embedded in the school context and took grades and attendance, advised groups (such as the *Out-breakers* group when crisis struck their studio in the hallway), and organized school practicalities and schedules.

I regress briefly to explain the model of instruction, of how the two teachers discussed pedagogical goals and objectives prior to the filmmaking week, and to explain the model the animation teacher advocated. One objective was to give students an opportunity to

learn about *developing a story*. Storyboarding was considered a means to learn story development. The teachers shared the concern that the computers would take up too much time and that the students needed a demonstration of how to use the computers as tools for editing. They compared *physical* stop-motion animation to *virtual*, computer-generated animation. The art teacher knew of a program called *Blender,* which is an open source CGI animation software program that has been used for teaching in another school (reported on www.emu.dk) and *Blender* has a large online community of users. But the animation teacher strongly believed that students would learn the basics of animation better when designing using *physical* materials as needed for stop-motion animation techniques. Work with art materials in a filmic expressive form was another objective. The art teacher found the principle of working with physical materials fitting. The art teacher agreed to use stop-motion animation and the software program *Stop Motion Pro*, a program that the animation teacher had used frequently.

Three clashing practices in the classroom are elaborated below.

The *animation teacher* enacted particular discourses through her instruction. She used phrases such as: reading films, using storytelling and learning about film language. The animation teacher discussed how film functions as a system of communication, such as how it uses metaphors—for example, the use of the hat in the Indiana Jones films. She mentioned traditions such as the seven basic plots and referred to professional animation practice and provided examples of animated films that used the three-act model and have popular appeal, such as the *Wallace and Gromit* films. But she did not specify film theoretical sources or background.

The *art teacher* integrated the filmmaking process with interdisciplinary perspectives; she assigned homework readings that were both theoretical and practical and refer to other subjects in upper secondary school as well as fine arts. The art teacher spoke of the practical work of filmmaking in connection with film, art and media theory; for example, she exposed students to contemporary, concept-oriented artists, such as William Kentridge and Pippa Lord, who use nonlinear narratives and political content in experimental animation.

The *students* referred to their own production and consumption practices and film/media/art experiences, i.e., also cultures from outside of school. Lectures in class about editing led to ongoing discussions in the film groups about how the editing of films, newscasts and TV series is done and how editing manipulates messages. Students questioned animation practices during class. For example, the *Out-breakers* group asked the animation teacher repeatedly about what type of animation they were doing in class and why they could not animate the pencil eyes with digital software (as expected). The *Out-breakers* group wanted to do pixilation, using human and non-human actors in stop-motion

animation. To this end, they had particular ideas about composing their storyworld as a set with human and non-human actors. They tried to set up an animation studio in a school hallway, but this plan failed due to technical difficulties.

In summary, there was a clash between these different practices when the animation and art teacher shared a focus on the physical animation and on aesthetics. These elements clash with the focus on the high level of experience with digital tools and the partial knowledge of animation preferences in regards to the *Out-breakers* group (see also Chapter 7 and 12 with conclusions about misunderstanding animation). The students in this group did not readily distinguish between physical and virtual animation, and their concepts seemed more in line with hybrid forms of animation and converging media (Manovich, 2001, 2006).

9.6.2. How to instruct with and about digital technologies?

An emerging pedagogical issue in this study is how to instruct students about the different technologies in the classroom and how to support the students in working with digital technologies in animated films.

The animation teacher taught with digital tools (software and digital cameras on the PC), but she was not able to solve problems when the digital technologies did not function properly, such as when she could not help the *Out-breakers* group shoot in their hallway studio location. She usually teaches with a technical supporter, but this arrangement was not possible in this case study. The school IT staff had agreed to help but they did not know the software and did not have much time available for technical breakdowns.

The art teacher initially stated that her goal was to learn about the film production process along with the students and assure that the students learned about both theory and practice in analyzing images in animated film. The art teacher evaluated her experience on the *AnimationsØen* (*The Animation Island*) Web site as follows:

> It was an intense and exciting week for both me and the students—and along the way it became quite clear that good IT people are a must. It was instructive to be partially in the role of students... Looking back, it was a pity that I didn't have a chance to make an animation film from start to finish before the week in the classroom.

The art teacher did not have a chance to make a film before the week of instruction—an animation workshop was planned, but failed due to technical issues. The limited technical support impacted on the flow of the week of instruction. The art and animation teachers used valuable time trying to solve breakdowns. A striking example was when the school's

IT staff accidentally cut off electricity in the IT room. This accident caused damage to the *Horses* group's PC FireWire card. Yet, the IT staff member did not have time to repair the card and thus precious time was lost for the *Horses* group.

The digital processes of saving, rendering, and capturing images as well as sound editing called for more support. The lack of basic information about using the technologies and the lack of assistance with technical tasks, such as how to save and transfer files for the working copy, was a major problem. The technical problems with transferring files between programs could have been prevented by checking how students saved their files. The observer from the Danish Broadcasting Corporation (DR) helped to solve problems and technical issues and assisted students with sound editing.

The student evaluations indicate that the students wanted a better overview of the technical the process of animation from start to finish (see the portraits in Chapter 9). However, the less than adequate IT support meant that students had to assist each other as best they could. I observed that many of the female students froze when there were technical problems, as if they were waiting or expecting someone else to solve it. The male students (and Dea) were active in helping other students. The implications of this gender pattern are raised in Chapters 12 and 13.

9.6.3. The issue of integrating students' reflections: how?

Another pedagogical issue is the integration of reflection balanced with classroom time used to introduce filmmaking (lectures with practical and some theoretical information) and time used for film production in groups.

The critique session on Day 5 (Window 3) was run so that time for each group was uneven, and so that the dialogue was mainly between the teachers and the group presenting. The teachers were the primary critics and moderators. The art teacher and I discussed the lack of further reflection to complete the week and that could also have been part of a film premiere. The technical problems on Day 5 may have impacted adversely on closing the filmmaking week and may have led to missed opportunities for reflection on film semiosis.

As discussed in Chapter 4, Shusterman considers reflection in terms of the educational position in not just about *having* aesthetic experiences, but also in *enabling* reflection on these experiences (Shusterman, 2006b). The underlying belief is that more exposure to opposing views and projections into imagined worlds can aid in gaining an understanding of ourselves and our worldviews (Shusterman, 1988). Thus, reflection does not *necessarily* develop from making your own film or viewing a film, but reflection can (and should) be enabled as a process, as discussed in the models of reflection in Chapter 4.

My analysis of filmmaking data indicates that the critique session did enable the students to verbalize semiotic choices and offered opportunities for questioning the worldview of their films as analyzed in Window 3. But the ongoing process of reflection is outside the realm of this study, as discussed further in Chapter 10.

9.6.4. Pedagogical considerations regarding storyboarding.

I find rich potential for engaging students in reflection about the construction of multimodal texts and semiosis based on this study. The potential is exemplified in regards to storyboarding. As my analysis of the three windows of data in Chapter 8 suggests, the students' work with designing films includes transducing modes in storyboarding and using multimodal (gestural, visual, verbal and audio) communication. The students are thereby involved in semiotic and reflection processes while designing and interpreting signs.

The storyboards offer many pedagogical perspectives and can contribute to what Dewey calls the educative experience. Goldblatt discusses how the viewer of a work of art interacts with or shapes that artwork in their minds with words or actions (Goldblatt, 2006). While art can be enjoyable in its own right, it also continues to change. An educative experience with art (or any sort of text) is thus part of a chain that increases the *capacity* for more experience, or the "knowledge of something else" (Dewey, 1938, p. 122). Storyboards and filmmaking, in general, potentially increase the capacity for critical reflection on diverse texts by means of gaining hands-on experience with design and technical production.

Storyboarding and the process of how the students used resemiotization offer potential for filmmaking in schools. Based on my data, the affordances of a storyboard support the film groups in the composition and clarification of their intentions for the meaning of the film. The static affordance of a storyboard offers an overview of the full time-borne film and can help students learn about composition. It also offers a tool for creating the multimodal film text as a coherent whole where the progression of time can be read in a compressed visual language.

The activity of storyboarding helped students to discuss their intent and helped them to structure how they worked out their ideas. The discussion led to concretizing ideas as they drew out the ideas, as seen in Window 1 with the *Out-breakers* group. It also had the potential to interest or motivate the students in a dialogue about semiotic intent. The storyboard makes film ideas explicit, tangible and available for dialogue between the students and between student and teacher. Thus, the students could give and receive responses and thereby alter ideas semiotically on the storyboard that functions as a forum for active, inquiry-based (pragmatic) learning. This kind of thinking can simulate what a professional

storyboarder and filmmaker does, or it can offer a simulacrum, as termed by Schön, for filmmaking.

The animation teacher provided a reason for storyboarding to the students: she said that animation is time consuming and therefore an animator risks the loss of sight of the main idea (or ideational intent). Storyboarding appears to facilitate brainstorming, and the storyboard as a text continues to be used for further idea development during production. The film groups followed the multimodal composition of storyboarding and reworked their semiotic choices, altering plans along the way. For example, the *Metamorphosis* group found its storyboarded film ending "too sentimental"—and altered it during the production phase. Storyboarding can also offer scaffolding for the teaching and upholding of a schedule within a compact week of instruction.

I have debated the pros and cons of storyboarding with several film teachers who have voiced counter arguments against the value of storyboarding. I present the arguments here primarily to raise questions about the impact of instruction in my particular case, and secondarily to discuss the teaching practice of storyboarding.

Two counter-arguments or *reasons for not using storyboarding* in instruction are:

1. Storyboarding is obsolete, given that editing images and sounds is easily accomplished with digital software
2. Storyboarding constricts the flow of creative ideas

The first reason, that storyboarding is obsolete, seems to have some merit. In traditional animation, the hand drawn processes were very time consuming and required detailed planning before shooting. This circumstance changed with the introduction of digital tools. But today, even professional animators still use storyboards to plan for 3D CGI because storyboarding assists in planning the flow of the narrative as well as in editing scenes. So, for pedagogical purposes, storyboarding in a classroom can be viewed in terms of Schön's *simulacrum* of the professional use of storyboarding to plan a film like a filmmaker.

The second reason, that storyboarding constricts the flow of ideas, does not fit with my findings. The affordances of digital media readily allow viewers to surf, for example, an array of digital TV channels or to browse the Internet and receive fragments of narratives. Therefore, storyboarding can serve pedagogically to focus the students on working with the main idea and planning out the unique semiotic code as well as selecting the right images and sounds to fit with that idea. Film ideas can still be altered in the process, as shown in the alterations made by the *Metamorphosis* group on its storyboard. My conclusion is that storyboarding is not outdated; rather, there may be an even greater need for practices that frame multimodal composition in our digital age, where we can cut and paste so readily.

Section III: Conclusion

10. Critique of the Study

This chapter reflects on the methodological and theoretical approach taken by presenting arguments for and against using the approach chosen for data collection and analysis. A particular issue is how the study relates to criteria of *validity* in accordance with Chapter 5. According to Kvale (1996), validity concerns both the issue of truth and knowledge, and the practical implications of whether a research study is based on the appropriate methods. A main question underlying my critique is: does the study investigate what it is intended to investigate? My approach to ascertaining validity builds on Kvale's work on validity in qualitative research as an expression of craftsmanship, communication and pragmatic application (see Ibid., pp. 242-245). Kvale proposes rethinking validity in terms of application: "by discarding a modern legitimation mania, justification of knowledge is replaced by application, with a pragmatic concept of validity," and he questions the validity of the validity question (Ibid., p. 19).

My perspective in this chapter is mainly on pragmatic application, thus, I reflect on how *actions* and text data relate internally, such as how the verbal statements and visual and other texts correlate, and on the practical application of this study.

The following three areas contain problematic issues and are covered in my critique:

1. The *representativeness* of the sample selected in the data collection
2. The *intervention approach* used for collecting data in a classroom study
3. The *discursive methodologies* combined to interpret data

The *representativeness* regards *who* was selected as informants and whether they constitute a relevant pool of informants for answering my research question.

The *intervention approach* includes a debate on the issue of invasiveness, including the videotaping activities. This debate involves a reflection on what is introduced into the classroom; the presence of outsiders (including me, the animation teacher and observers), and the new practices of animated film filmmaking in the art class. The intervention also brings up issues of how I as a PhD student researcher balance being a project leader and having a goal of co-designing learning materials with a partner in a research project.

The *discursive methodologies* topic includes a discussion on my optics on agency. I reflect further on the issues of having a cultural and psychological position toward the embodied, aesthetic processes of designing and reflecting.

In a final discussion, I collate the critique and discuss how and whether the problems are resolvable and how they pertain to the conclusions in this study.

10.1. Considerations about Representativeness

Here I discuss the issues relating to my sample and how this impacts on the results and conclusions in terms of my research question. As mentioned in Chapter 5, my criteria led me to recruit students with *varying interest levels* in the arts and digital technology. I presumed that appropriate students could be found in an obligatory art class and in the humanities and social studies program at a college preparatory upper secondary school (Danish *gymnasium*) with a fairly typical curriculum. I also presumed that since the majority of students in this program are female, my sample would have a relatively low experience level with digital media tools, such as software.

I question internal validity in regards to consistency and differentiation; how representative my sample is for addressing my research question. Below, I discuss the sample of participants in regard to the school's profile and the teachers, the whole class and the students. One critique of my study is that it involved a small sample; a class of 21 students for filmmaking, and five (of these 21) for portraits. I approach this problem by questioning whether and how my results relate *internally*; do I obtain some saturation of data, with similar results indicated in different film groups and across interviews, and do I obtain internal varieties and contrasts in the range of interest for arts and media per my criteria.

10.1.1. The school.

I selected the school based on a recommendation from a consultant in the Ministry of Education. But the school is not quite typical because it was once known for being politically progressive and had a reputation for being politically active and somewhat leftist. Consider how Ben talks of the school's identity as having "a ghost from the past" as a Red school. But the school (anno 2005) fits my criteria as it attracts a variety of students from different social backgrounds and the curriculum is traditional.

The school was supportive but did not provide any extraordinary assistance. The principal supported the class's participation in a research project and he praised the pedagogical benefits of integrating group-oriented project work, cooperation between a teacher and researchers and the external partners (DR and TAW). The art teacher was very interested in experimenting with the practical elements of hands-on filmmaking and film theory but did not incorporate the experience in the art class afterward.

10.1.2. The class.

The research project was brought into the school and introduced to the students as part of fulfilling requirements for an art class in their third and last year of gymnasie. After estab-

lishing the agreement with the class (the 21 students), I was told by the principal and the art teacher that the class had a difficult second year (2.G) and was known as a "loser" class due to a high drop-out rate, cliques and fairly low scholastic achievement. Yet the students fell only slightly below the general, national average for grades in the Danish *gymnasie* humanities program, according to statistics (available from Web site: UNI-C, 2005) and their class background and ethnic diversity for qualitative studies about the Danish student body (Illeris et al., 2002). The loser image comes up in Anna's interview, where Anna calls her class "the school's black sheep" and considers her drawing of the class (in her portrait in Chapter 7) showing them as winners of a prize for dressing up at a school party. She mentioned that this boosted the class's morale: "Something finally succeeded for us." In the same vein, the teacher and principal mentioned to me that they were glad that this class would get some special attention in a research study and reported a "boost" in the class after participation. I do not find the loser class profile relevant in terms of validity. Rather, the class profile might bring out *more* of the paradoxes and hindrances to integrating designing and reflecting on art and mass media in schools, which I want to explore.

10.1.3. The students: selecting interviewees.

Two issues influence my findings; (1) my selection of the more active students from the two film groups for the five portraits in terms of bias, and (2) their social background (class) and ethnic diversity. The consequence of this selection on my findings is taken up in the following section on internal verification.

My selection of interviewees for the portraits has a bias in terms of selecting the students who were more active in filmmaking. Thus, I gained more information on students with leadership qualities (as illustrated in Table 7.1, listing roles). I did include one student who talks of frustration with her secondary role (Celia). Consequently, I risk presenting only the more interesting roles, such as instructors. However, I attempt to make it clear how this influences my findings by pointing out which roles they have in the groups.

All of the five students chosen for the portraits are from fairly middle class family backgrounds, and their parents' professions range from being a property manager, cook, teacher to being a well-known actor. The students have diverse ethnic and cultural backgrounds, although this is not borne out in their physical appearance or clothing. All are completely fluent in the Danish language and grew up in Denmark. Of the interviewees, several are ethnically mixed: Celia is one-fourth Asian (one grandparent), Ben and Dea report having a non-Danish parent (US American and mid-European). Three out of the five students in the portraits have family living in other countries. Ben, Emil and Dea mention visiting family in other countries (Europe, the US and the Middle East).

10.1.4. Internal verification: patterns across findings.

The class size and portraits indicate that a large enough sample was used to ascertain internal verifiability in the patterns. The students (in the five portraits) report a wide range of interests and differences in art, media and technology use, but also show repeating patterns of interests. I had analyzed eight portraits (including Frede, Gina from the *Horses* film group and Henrik from *Onion Man* group) but left three out, because these three did not provide new insights. However, the results from these three verified the five remaining portraits. For instance, the stated preference for performance and body art by Dea, and to a lesser degree by Ben, was confirmed by Henrik, who was into piercing, body art and punk subculture. The strong interest in drawing during childhood by Anna was expressed to a lesser degree by Emil, as well as by Gina, but Emil and Gina stopped drawing around puberty. Emil has been very involved in the on-line games *WoW* in his early to mid teenage years, Dea has also used *WoW* and other online games, and Henrik has also been a heavy user of online games.

The triangulation of the portraits with video data, observation, and evaluations by students and teachers also served to verify results and point out some disjoints. I cannot ascertain how representative the whole class as a sample is in regards to patterns in groups (positioning and roles) since I have no comparison with another class. My findings from the week-long workshop cover five film groups and I observed how the roles within the five groups were divided in different ways. The two film groups that I highlight show differences in the approach to leadership and fall along a spectrum, or are more or less "egalitarian," to use Emil's term. The *Metamorphosis* group has a strong leader in Anna, while the *Out-breakers* group has a shared leadership between Dea as the primary leader and Emil as secondary leader.

The students who were known as highly competent with art-making and/or technical aspects (such as Anna and Dea) appeared, from my observations, to take leadership roles and were also expected to take on leadership in the different groups. The most egalitarian was an all female group (*The Spot Is Mine*). When I asked students to consider roles in the interviews, their discourse corroborates observations that expertise and social roles are taken for granted, i.e., students *talk about* roles as embedded. But they start to put words on the roles during the interviews. Yet all the students I interviewed talked spontaneously about the relation between using the computer and gender (i.e., Dea saying she is a computer nerd and how it is unusual for "a girl"). Students are more or less self-reflexive in their verbal statements about roles and behavior (actions); for instance, Anna almost apologizes for having high ambitions and perhaps excluding others during her interview. On the whole, the students' own remarks confirmed what I observed on behavior. Kvale (1996) and

Schrøder et al. (2003) describe mismatches as a common aspect of interviewing, where self-reports can fluctuate during an interview, be ambiguous or even contradict behavior.

In summary, the selection of students is biased toward the active students, but I still find them representative and relevant for my purposes. There is some disjointedness or paradoxes between the actions observed and the analysis, but this is mainly within the interviews and how the interviewees discuss their own photos (disussed also in 10.3.3).

10.2. The Intervention Approach

My intervention approach was based on ethnographic use of videotaping. This intervention altered the usual classroom situation in various ways, which in turn brings up methodological issues, such as the dilemma of reconstructing what the researcher intends to study. I have already highlighted the issue of videotaping as an invasive documentation method that students react to by performing for the camera (in Chapter 6). Another issue around intervention is the many outsiders, practices and new technologies introduced in the school. A point of critique is that the students (and teachers) perform differently; first, in the here-and-now classroom, due to the intervention of the study, and second, performing for two future audiences. One of the future audiences is the *academic* (the researcher) and the other one is the *schools* who use the DR Web site.

A key issue is how the intervention influences findings, i.e., by asking the students for more reflections about art and media in the classroom and during interviews. The question is how this affects the validity of the research in setting up or constructing the events that I studied, and how *asking* is a factor in *bringing about* the students' reflections on media and aesthetics. Also, due to the fact that I am a woman asking questions, especially those on gender and the students' roles in the groups, this factors into how the students respond.

10.2.1. Discussion of intervention.

The intervention changed events and, yes, interfered and intervened with practices among the students as well as the teachers/school. Yet, I venture to say that this was within the dilemma of a postmodern, discourse analytic framework. My process of gathering data was planned to allow me to establish a good rapport with the participants (Schrøder et al., 2003); thus, validity is more a question of how I built a relationship with the students and teachers in the case study and whether the data allowed me to gain relevant insights in regards to my research question.

The reflection process that I am studying is presumably altered by my project, my videotaping, my presence and the whole research design as an event. For example, I wanted the teachers to make time for reflection. Doing a critique is part of their teaching practice, but I encouraged it.

The reflection is built into the interdiscursive, multimodal approach I take. In the photos for the cultural probes, the students select and critique art and media (for me, the researcher): Anna includes a class portrait, Ben pastes in ads from a magazine and comments that these ads "use sex as a means to sell… which seems the same as in the Iliad," Emil reflects on politics and news coverage with his "media cavalcade" of campaign posters. In so doing, the students show how they understand my research project and they reflect (for me).

The animated films were shown by students to one another, and to a possible larger audience on www.dr.dk. The students asked repeatedly about who would see their work, what was confidential, and how the animated films were to be showcased on www.dr.dk. These perceptions of audiences may have affected the students' participation in a positive way.

I find that the interviews brought about reflections on art and media; for example, Dea actively interprets her own photos in the interview while she reflects on how she interprets performance and art in general. I elicit stories and ask leading questions, which the students respond to, usually by telling me more stories. I was able to develop a rapport with the participants and they told me rather personal details. But I exercise ethical limits on how much I led or how personal my questions were during the interviews. For example, Celia associates her photo of the hospital with bad memories; I do not ask her to tell me more. In this way, I try to avoid eliciting conflicts or emotions that I cannot follow up on and that are not relevant to my research.

In summary, the research interferes and constructs in that it presumably sets in motion the processes that I study (namely, students' transformative processes of designing and reflecting about art, media and film). The videotaping, the constellation of DR, academic researchers, and cooperating art and animation teachers expanded the school context. My interventions may have promoted their explications of what art and filmmaking or writing are about: to communicate meanings and bring those meanings into play with others and to generate a response. Thus, the research enacts the reflection that I want to study, which can also be considered its strength.

10.3. Considerations on Combining Discursive Approaches to Analysis

I discuss here how having multiple units of analysis (text and action and the interaction between the two) and theoretical perspectives may present problems. There is a risk of twisting and bringing together epistemologies (logics) that do not mix or combine, or of trying to accomplish too much. The tailoring of my own methodological tool box involved trying to gain an overview of various fields and integrating interdiscursive approaches. The reflections that I detail with respect to the following three areas focus on considerations of combining discourse analysis, as follows: (1) how to gain insight into identity of the agents (i.e., the student filmmakers), (2) how MDA is combined with text analysis based on Social Semiotics to exemplify text-action trajectories, and (3) how iconography aided in analyzing the mismatches between the students' visuals and verbal discourse in the interviews.

10.3.1. Questioning the psychological cultural perspective.

I found the psychologically oriented cultural position useful for uniting the sociohistorical and the personal (individual) dimensions. Bruner asks whether social science with the use of theories about personality and culture really faces up to not being able to compare or measure individuality on the one hand and cultural identity on the other, which is an "incommensurability" (Bruner, 2006, p. 13), referring to a lack of common measure and involving switches from one paradigm to another. This study has incommensurability issues that cannot be resolved, but I can attempt to clarify why I chose to make such switches and how they impact on the results.

I approached my data as an exploration of the sociocultural aspects of storytelling as a mediated action. My analysis of the texts and the metaphoric symbolism in the texts does not involve applying a psychoanalytic perspective to the individuals, meaning that I do not try to bring the meanings in the texts back to the individual filmmakers as related directly to their particular emotions or personalities. However, I come very close to the psychological dimension of experience. For as Bruner writes, in an attempt to deal with the puzzle of personality and culture, one can choose the position of a psychodynamic notion of self in relation to how a culture's norms and ways become incorporated into our sense of self.

Bruner points out that the model inherited from Freud makes it seem as if individuality is pitted against the ways of the culture, i.e., the individual is defending himself against the demands of the culture (Bruner, 2006, p. 14). Bruner suggests that the shaping of our psychic realities is largely from the outside in. We are shaped by the patterns of daily cultural

life through the stories we tell and listen to; from our earliest childhood, we are in a narrative exchange that shapes our psychodynamics.

As discussed in Chapter 4, I adapt a view that learning and identity theories are interwoven with culture and essentially, I take a psychological and phenomenological (inner) point of view on human development based on the idea of body schemata of inner experience (Johnson, 1990, 2007). This point of view on the individual filmmakers regards their external expressions (as in their photos and films) as containing metaphors of their inner experience. This view relies on a synaesthetic basis of how humans sense, use metaphors for meaning, and develop their creative imagination and reasoning, or their schemata for meaning, in the way that Johnson and other pragmatists describe. See also Chapter 11 on my contribution and further ideas for research that explore issues of creativity, self and identity.

10.3.2. Combining MDA and text analysis.

Methodologically, my approach to exploring experience, multimodality and how discourses are mediated was based on the MDA microsocial approach to actions in the classroom. One problem was selecting the windows and exemplary trajectories to study the social action of designing and reflecting. A few significant trajectories would suffice to show the nexus of units of interaction and text and experience of agents. However, I had to adapt MDA to my purpose of analyzing films closely. By using an MDA along with an iconographic and semiotic interpretation of multimodal texts and subject matter, I could combine text analysis with MDA analysis of multimodal actions. MDA allowed me to get a grasp of the multiplicity of communicative modes (verbal, gestural, etc.). For example, it allowed untangling the movements between agents and deals with lack of verbal dialogue (as mentioned, my video data included periods of silence and I wanted to capture the embodied actions, such as Anna and Celia demonstrating running with their bodies when trying to figure out how to animate the running of their figure Daphne). The multimodal approach to analyzing the mediated discourse in the filmmaking also made me sensitive to how differently the students articulate and embody experience in the interviews; Celia talks of bodily sensations (such as tingled) in her interview, while Anna freely associates art-making to visuals and also talks of bodily experience (such as letting monsters out and getting relief) in her interview.

10.3.3. The integration of iconography.

Iconography, which provides a way of handling *subject matter* in visual images, is helpful because I faced a situation in the interview analysis where the photos and what was said

about them struck me as having mismatches. I wanted a way to make these mismatches clear, to show that things may not be what they appear to be. Exploring the multiple layers of meanings is an attempt to explore polysemiosis and to relate external to internal (mental) images. In the iconological approach to analysis, Panofsky suggests that this approach can, "show how the 'essential tendencies of the human mind' are translated into visual themes and concepts" (Panofsky, 1957, p. 41 in Rose, 2001, p. 147). I attempt to use what Panofsky calls a good eye and common sense in my analysis.

Analytically, larger patterns appear in what Willis calls "the mystery of the relation between the general and the particular…[which] encompasses the contradiction that general social forces or determinations are enacted only through the particular will of individual agents" (Willis, 2000, p. 6). I point out that the larger patterns in meanings that I interpret in the students' multiple discourses may not match the students' own interpretations. Panofsky talks of the same possibility of the lack of recognition by subjects to interpretations, especially in regard to the third level of symbolic and iconological interpretation.

My application of the third level of Iconological Symbolism in an analysis of student photos is not based on a claim of finding the one and only, or true, meaning hidden within the text. I attempt to expose how polysemic or multi-faceted the photos are, how the images contain levels of meanings and how they might be understood. Approaching images with iconography requires familiarity and an intuitive sense (the researcher's) as Panofsky describes, but it also calls for integrative interpretation, i.e., principles that integrate the qualities of being autobiographical, psychoanalytical, theological, sociological or philosophical (van Leeuwen, 2001). I believe that I possess a good measure of this intuitive sense, because I have trained my eye and sensibilities as a visual artist, art teacher and art therapist, all of which have contributed to giving me a wide exposure and sensitivity to images.

10.4. Discussion on Resolving Issues

I consider the sample of students to be a fairly typical representative of Danish 18 year olds in 2005. The school is metropolitan and culturally and socially diverse. The students, the class and the school profile fit well with my underlying interest in the postmodern era and digital youth culture. The study is an intervention and thus the students are viewed as co-participants in a constructed research event.

The gaps between the social semiotic and cultural studies theories led me to grafting methods for analyzing the films as complex, multimodal texts using an integration of social semiotics and multimodality theory with iconography. A hybrid method of MDA and social semiotics and iconography is a lot to integrate. I could have chosen to do straight for-

ward social semiotics. My concern was that the texts could not have stood alone, but that it was relevant to flesh out the agents and actions involved in the filmmaking, so I also had to do an application with the multimodality of embodied actions of filmmaking. The interviews help me to understand what I could only partially interpret in the video data about positioning in the interaction order (roles) in the filmmaking groups.

Since MDA is sociocultural and concerned with the multimodal experience, it assisted in opening up my understanding of tools, mind, action and cognition. This kind of embodiment of aesthetic experience is supported by the synaesthetic basis of multimodality, in the theoretical works of Willis, and in the pragmatic models proposed by Dewey and Kimbell, Schön, Shusterman, and Eliot.

The orientation I take on action stems from the pragmatic thinking of Dewey and is influenced by a pragmatic view on the aim of encouraging participation in democracy. This orientation led me to consider a normative direction, such as having a concern with practice, social responsibility and a spirit of improving the condition of the world. While I do not take on the full normative baggage of the idealism of the pragmatic tradition, I do find it relevant to consider issues of social inequity, such as how media literacy relates to the gender digital divide and citizenship, and the role of art and creativity in society (see for example, Joas, 1996, 2000; Shusterman, 2000).

My use of pragmatic learning theory may seem dated in terms of the complexity of school and culture in a digital era since Dewey wrote on aesthetics in the 1930s. But I find that he provides an interesting, older perspective on the discussion of hybrids and emerging communicative practices in the arts and media. I believe that social semiotics, with its synthesis of theory on representation, synaesthetics and literacy is useful together with pragmatic learning theory for my purpose. Combined, these theories assist in providing a wider understanding of the notions of culture, media, arts and learning and investigating transformation as a double process.

11. Contributions

In this chapter, I briefly set forth the contributions of this study. The focus is on the following areas:

1. *Input to the academic debate* about youth and media production in relation to learning
2. Developing a *methodological toolbox* for further discussion and application
3. *Practical applications* to support teaching practice on filmmaking in schools. This includes publishing Web-based interactive learning materials.
4. The chapter discusses what is new in this study and *considerations for further studies*.

11.1. Input to Academic Debate

The *input to academic debate* arises from the unique methods used for data collection and analysis and the findings, which offer a contribution to the growing field of empirical studies about youth producing digital, multimodal texts. The data and findings can be applied to leverage the academic and policy debates about young people's design (or authorship) of multimodal text inside and outside of school. The increasing opportunities for the authorship and dissemination of multimodal texts by young people using digital tools is gaining interest in research, but it is still a relatively small field, as mentioned in the literature review.

In comparison with most of the media and arts research in the field, this study is unusual, with its topic of animation, the detailed portraits of the filmmakers, the combined optics on the semiotic, cultural and cognitive, as well as publishing a Web site with learning materials. This study has an unusual combination of examining the form of finished animated texts and offering narrative about how the stories came about, including the attempt at bringing out the voices of the students as filmmakers and their frustrations about filmmaking. The aim was to gain insight into the creative process of design and the reflection process. Accordingly, this study furthers academic debate about how young people design as a creative, multimodal and collaborative process.

My decisions to draw on English, US American, Australian and northern European theorists and to write in English is an attempt to bridge academic debate between the Anglo-oriented and Scandinavian traditions of research in art and media and to participate in a wider international forum for debate.

In an attempt to further academic debate, I have two goals for dissemination of findings, as follows.

The primary goal is to contribute to the understanding of multimodal text design based on findings from this study seen as related to developing an understanding of the dual transformative processes (inner and outer sign-making). I have collated the findings into a profile of competencies in Chapter 12. This primary goal has also been achieved through dissemination of results at conferences (Frølunde, 2006, 2008a, 2008b). I plan on publishing articles about my findings in international research journals that have an interest in the intersection of art, media, learning and technology; one is in press (Frølunde, in press 2009).

The secondary goal is to disseminate results to interdisciplinary practitioners, including cultural institutions working with young people, teacher training programs and teachers in secondary schools (and to a lesser degree, elementary school teachers) in Scandinavia. The secondary goal has been achieved through the publication of Web-based learning materials about animated film theory and production on www.dr.dk, and presentation of results to various art and media educators (for example, at the Danima conference, see Israel, 2006).

11.2. The Methodological Tool Box

The development of a *methodological toolbox* is a contribution in terms of addressing how to analyze multiple forms of discourse, including the students' animated films, the interactions between students in the semiotic process of filmmaking, and the discourses that are part of the students' everyday culture.

The methodological tool box is inspired mainly by social semiotics and different discourse analytic approaches from Scollon, Norris, and Iedema. I leverage pragmatism as my primary approach to critical and aesthetic reflection, draw on Vygotskian notions of mediation and refer further back to Bruner and Bakhtin. Because I had to construct a framework to try to combine these elements, I adapted MDA to analysis of excerpts of data on the students' multimodal actions and integrated MDA with a formal textual analysis of their films based on social semiotics and iconography.

The various visual methods for data collection include using videotape, visual texts (such as storyboards, films, and photographs from the cultural probes) and referring to the visual texts in the photo-elicitation interviews. The discussions on methodology in this thesis hopefully contribute to furthering an interdisciplinary approach to theory and methodology. I hope that other researchers graft elements of my tool box for data collection and for discourse analysis, and continue the discussion of how to combine theories on representa-

tion and learning as relevant for understanding semiotic processes, cultural affinities and cognition.

11.2.1. The Practical Applications

The *practical applications* include supporting multimodal text production in school and outside of school, and the resulting design and publication of new types of digital learning materials *AnimationsØen* on www.dr.dk. This study aims to question educational practice and promote a pragmatic approach to multimedia production by young people in various learning contexts, whether school or outside of school (such as filmmaking workshops at cultural institutions). My findings point to rethinking the relation between reflective thinking and the learning process involving all types of media (i.e., new and old platforms). I hope to contribute to conceiving of digital technologies as having a potential for being integrated in the creative subjects especially. I do not, however, voice a kind of celebration of technology, or a concern with the threat that new technologies pose to youth.

The perspective in this study is *dialogic reflection* as a process of ongoing learning, rather than on a particular material or tool or technology as an isolated instrument of change. There is such great complexity in the factors and interrelationships involved in learning, such as the students' embeddedness in cultures outside of school. I have attempted to exemplify this, for instance, in the students' participation in on-line gaming or experience in museums. Student-teacher-school interactions are important for learning and deserve more attention than is possible in this thesis. I discussed the pedagogical potential in Chapter 9 and turn attention to this again at the end of Chapter 12.

11.2.2. My contribution: what is new?

This study contributes to a tradition of art and media research that considers how young people have been involved in making theater and art, or writing for newspapers and critiquing television shows in and outside of schools, as mentioned in the literature review. The subjects of arts and media have a strong tradition of applying an experiential learning approach, which is evident in the teaching plans for these subjects in Danish upper secondary school. I hope to promote further discussions of the importance of integrating the experiential approach (i.e., both concrete action and reflection in the abstract sense). Practice in schools based on creative activities that build on learning by doing and reflection was advocated by Dewey over 70 years ago. So, my pragmatic message is not new, for example Shusterman also builds a model of reflection based on Dewey, and recommends that people need to create, experience and they need reflective criticism, including self-criticism,

in order to release their creativity. However, schools still struggle to realize this potential, even though there is rhetoric about enhancing *creativity* (see Banaji & Burn, 2007).

I hope the findings from this study can rekindle the debate on the pragmatic approach to composing multimodal works in schools. Designing films was engaging for most of the students in this study and I find that there was an unrealized or pedagogical potential for increasing media reflection, see Chapter 12. Mass media are exploding and will most likely continue to fill even more of young people's lives; the implications are that designing, interpreting and critiquing media (new and old) in schools is crucial. I discuss perspectives and implications of literacy in regards to educational policy in Chapter 13.

11.2.3. Publishing new types of learning materials.

As reviewed in Chapter 1, an initial aim of the research project was to contribute to the theory, practice and design of new educational technology. This aim was based on an interest in supporting how filmmaking is taught in school (across art, media and language subjects) and how to support its further development. My aim shifted so that the research question became centered on how the students were designing and reflecting. However, the analysis of the data from the week-long filmmaking course, interviews and design workshops at the school led to a concept, design and production cycle in cooperation with DR (Frølunde et al., 2007a). The results were available to schools subscribing to DR's educational Web site.

I point out that the Web site includes extensive materials for teaching and relate this briefly to the availability of similar materials for teachers in upper secondary schools in order to make a point about the need for additional materials that offer an integration of filmmaking practice and theory for this school level. I discuss two directions for teaching film to make my argument.

One direction is teaching material about film for schools, aimed at analyzing finished films, such as commercial films. There is a wealth of relevant materials for teaching about film in Denmark, available from the Danish Film Institute, DR, and *Ekko* magazine. There is a common portal for the educational sector (see www.emu.dk) and publishing companies.

Another direction is giving children and young people an experience with a hands-on filmmaking approach, such as the Film-X studios at the Danish Film Institute. In particular, Station Next is a program where film professionals teach youth filmmaking in workshops and in an ongoing program. Station Next offers relevant teaching materials on their Web site (see Wad & Vesth, 2007). The Web site Dvoted (www.dvoted.net) for young filmmakers in the Nordic countries offers a wealth of discussions about filmmaking and showcases

films. Danish film festivals offer hands-on workshops including animation, such as the annual Buster festival in Denmark. The Animation Workshop, Center for Animation Pedagogics, has participated in the EU Leonardo program for *Teaching with Animation* in an effort to make learning materials, but this is mainly for younger children.

However, there is not much teaching material and literature about combining hands-on experience with filmmaking and film theory for young people. Exceptions include *Fokus* (Katz & Poulsen, 1997) a book about filmmaking aimed mainly at the subject of media, which offers practical and theoretical frameworks applicable to lower and upper secondary schools and Fat on Film, a section under the Danish Film Institute's Web site.

The point is that *AnimationsØen (Animation Island]* contributes to integration of theory with practice. The Web site is unique in that it disseminates the animated films made by the students in this study, by offering multimedia clips of historical footage on animation (from DR's media library about Danish animators) and by offering theoretical perspectives on animation. These media materials are integrated into a review and critique of a film production process along with guidelines for structuring instruction in schools.

11.2.4. Considerations for Further Studies

My considerations for further studies stem from my interest in creativity and semiotics in user-driven content by young people and methodologies for art and media research.

I highlight here interest in studying the following issues further: contexts for learning, longitudinal studies of young filmmakers, collaborative storytelling, gender and animation (see below).

Contexts for learning include studying how filmmaking and design unfolds in contexts outside of school, such as museums, networks for filmmaking, and film workshops at festivals. I am interested in developing methodologies for capturing the interplay of youth, context and showcases for films used by young people, such as YouTube, Flickr or Dvoted. A research design that is longitudinal seems to me to hold promise for relating context, text and agent to learning, and for relating new types of public spaces for display to the development of texts and agents and complex learning processes. Through my participation in the Scandinavian *Making a Filmmaker* research project, I have been studying how young people develop a strong interest in filmmaking (see Frølunde et al., 2009; Gilje et al., in press 2009; Lindstrand et al. in press 2009). A final report compares such contexts across Denmark, Sweden and Norway, see *Making a filmmaker* (Gilje, 2009). The *Making a Filmmaker* project may continue as we are seeking funding to look further into contexts for filmmaking and do a longitudinal study of filmmakers.

Collaborative storytelling refers to co-designing across modes of language. This area involves exploring the way young people relate to public art and film events, museums and cultural institutions (see Andreasen, 2008; Illeris, 2006). For example, I would like to study public collaborative artworks by the Danish-Icelandic artist Olafur Eliasson where anyone can join in and build with LEGO bricks (but only white bricks are available) in cities (including Tirana, Copenhagen). I am interested in different settings for multimodal narratives about how people relate to each others' stories and interpret metaphors. It also interests me to explore different methodologies for capturing how people exchange narratives (see Gauntlett, 2007; Gjedde & Ingemann, 2008; Robertson et al., 2009). One focus for further study could be how people design within a restricted but very flexible visual system of language, such as LEGO bricks. This interests me as a way to explore creative collaboration and the concept of visual grammar and lexis further.

Gender and perceptions of technologies fell along fairly stereotypical gender lines in this study. I hope to follow up with studies that take up these gender issues. Research into *why* gender patterns recur and what can or could have been done to alter this pattern deserves much more attention than I can give it here. I hypothesize that there is a social interaction order in terms of the expectations students have about each other and levels of technical and artistic experience. The software packages used in this study were not particularly user-friendly and not as sophisticated as some students hoped they would be (especially Dea and Emil). Digital media can be unstable and frustrating to use, therefore research into how other instructors use them and other types of software for editing and designing films is pertinent.

My interest in animation, specifically for further studies, includes how young people might perceive space differently due to navigating in virtual, animated space. I wonder whether people develop a different sense of temporality through exposure and training in animation. Interesting groups to study include young amateur animators and professional architects, who use CGI tools for 3D visualization.

11.2.5. Discussion from a skeptical view of new media.

My findings point out that culture is shifting toward the visual, yet I maintain a skeptical view of a concept of "new" media as changing social processes fundamentally. Integrating a new platform of media does not *in itself* solve educational issues—for example, a crisis in training youth to become more creative. Is the media situation really new, or rather, what is new about it? It is new and different that digital media afford resemiotizations so readily and allow for fluid authorship across modes and that digital media tools are more affordable, as I have discussed earlier. I recommend, however, further critical consideration of

what is *new* in terms of the actual use of digital media tools, including asking whether youth are as savvy and capable of designing multimedia production on their own without instruction as they are with instruction, and how becoming competent with digital media tools might relate to social inequities.

An updated review for NESTA Futurelab on *Creativity, technology and learning* (Loveless, 2007) highlights the rapid development of technologies for communication over the last 10 years and questions the impact on young people's creativity and experience of physical and virtual space in relation to the use of digital technologies. Creative collaborations that can be supported by digital technologies are proposed as increasingly offering opportunities for connections between learners and practitioners, such as shared on-line spaces for making and developing work with others across a range of materials, media and audiences. This indicates that there are still many questions about how, when and why educational practice can include digital tools for creativity, which I also find important to consider. Further studies should include a revisit of creativity, which is often unclear and used synonymously with terms such as innovation, or good learning (Banaji & Burn, 2007).

In my opinion, there are new challenges to education because youth grow up in an increasingly visual, global and media culture. Youth are increasingly influenced by commoditization and globalization of culture through mass media. Technological advances are making it possible to have interactive Web sites and to showcase (upload) user created audio/visual productions. These practices alter opportunities for making and disseminating multimodal representations and potentially, for showing and reflecting about one's sense of self. The "new" media phenomena offer different affordances than older forms of art or filmmaking, and blur boundaries between pop and elite art and media forms. Yet I am skeptical about how much the availability of digital media radically changes *learning* processes and especially *creativity* in and of themselves, which stems from my focus on shared cultural narratives and the self–other dynamic in the sign-making process. Another question is how to integrate digital media tools into *educational contexts*, which I return to in Chapter 13.

12. Conclusion

Chapter 12 presents the conclusions regarding my research question on how the students design and reflect in a double process: their inner transformation and the outer transformation of their multimodal texts, especially their animated films. I propose that the answer lies in the complex interplay of learning about signs as filled with multiple meanings and the culture of others in relation to one's self.

This chapter has two main topics: (1) a discussion of the research question on how the students design and reflect but also misunderstand animation, which leads to (2) a profile of multimodal design competence.

Before these topics are presented, I review my line of argument about developing literacy relating to multimodal design. Developing competence or learning in a positive sense is not a given, but a potential, as the concept of learning includes mislearning, such as dealing with frustrations and misperceptions. In this case study, there is the potential for learning about filmmaking as a resemiotization process involving constructing narratives of self using metaphors that relate to our bodies and our identity, a process that unfolds continually with other people.

Composing with multimodal signs and sources is an embodied and meaningful process of inner and outer sign-making. The resulting animated films in this study exemplify the idea of animated symbols; they are unique, multimodal ensembles using the modality of animation and its special affordance for representing the fantastic. But any semiotic process of composing and multimodal text involves an ongoing two-way dynamic of transformative processes, and also includes other people (shown in Figure 4.1 as a self-other-sign model).

A filmmaker is potentially *learning* about how signs are filled with meanings by actively composing their own films as a unique ensemble of signs. When a filmmaker gains experience about how the composition of a film is done, this individual filmmaker may thereby also develop a more critical and aesthetic awareness about the underlying principles of semiosis that apply to any type of multimodal text.

I consider reflection essential for connecting the inner and outer processes. However, a deeper level of reflecting only *potentially* occurs (as discussed in Chapter 4 with regard to the art appreciation model by Shusterman). The above review of my argument is meant to explain why this chapter presents my conclusions in terms of learning potentials and competence as well as considering hindrances to learning.

12.1. Answering the Research Question Based on the Animating Symbols Model

Here, I refer to how transformation processes can be seen as continually at work in our narratives in a dynamic between self and culture. The filmmaking design and reflection processes occurring in this case study are used as an example of an active representation of the individual and his/her self in texts (as challenging as this is, as discussed earlier). A reflection on such identities brings up interpretations of symbolism, discourses and value systems. I describe this reflection as dialogic in the model Animating Symbols. Dialogic refers to the Bakhtinian idea of the interanimation of voices (see Wegerif, 2008; Kress, 1997; van Leeuwen, 2005) as a continual dialogue within texts, between people and with previous works and authors. The dialogic also refers to a view on learning and philosophy, as discussed in Chapter 4. It inspires my view on how the individual transformation happens in a dynamic process of interacting with texts and with other people as we share cultural narratives.

Consider how the student films use humor to communicate their serious thematic contents of power and transformation, such as how the humor in the *Out-breakers* film is central for carrying a serious side of the film's meaning. The students are self-reflexive of how they interpret the people and the things around them with reference to different tastes and styles (or genres).

I find that the students refer to and identify with art periods and art institutions and the power of art in very different ways. In the interview, Dea says she prefers what she calls body art and seeks the relational in art, which she finds open to interpretation. In contrast, Emil seeks out old, even ancient, art works, and finds little appeal in modern or avant-garde art. The students exemplify different compartmentalized notions of art. The students shape identities through continual questioning and reflecting on discourses through choosing particular styles of expression, including dress, art, and TV shows. They seek to define their "self" and present themselves and negotiate roles in relation to others (referring to Goffman). The students participate in various globalized youth subcultures, for example *WoW* and Rastafarianism. However, I question how their reflections on the discourses, identification with subcultures and modes of representation in their everyday life are being applied in school and how their prior knowledge, such as what they know about animation, is being applied in school.

12.1.1. How and why students misunderstand animation.

What follows is further exploration of the following two issues concerning mislearning: (1) the students' misunderstandings about animation, which I find indicative of the influence of prior experiences with technology, and (2) the influence of the teachers on the students' misunderstandings in the classroom.

My findings indicate that students experienced hindrances in filmmaking related to previous experiences, including their misunderstandings about animation, perceptions about the affordances of technologies, positioning along gender patterns of expertise in groups and technical break-downs at the school. I highlight the negative side regarding challenges here, but this is not to devalue the positive learning experience and possible gains in the case study. Rather, it is based on applying learning theory and wanting to reveal various real-life challenges in the classroom. For instance, it is difficult to design films as a group process, difficult to teach filmmaking to a diverse student group in a regular school, and difficult to evaluate gains in learning (such as developing multimodal design competence). I clarify these challenges below.

Dewey believed hindrances are learning opportunities, but it is *the resolution of frustrations* that is a springboard to insight and development and that drives curiosity and creativity forward. I doubt that the resolution of students' frustrations was possible in the timeframe of this study. The findings point out some gender differences with technologies, with a more negative expectation and computational reticence among the young women. A notable exception is Dea, who has a positive view of computing. Celia talked of wanting to edit but cannot, while Ben wants to gain footing as an editor and he goes readily into solving the technical issues.

The students were confused by the stop-motion animation in the classroom, which can be attributable to being more or less experienced *millennials* (Pedró, 2006) and to the situation of new production technologies that make it possible to create hybrid moving image forms, (Manovich, 2006) as discussed in Chapter 3. Dea and Emil have a prior but patchy knowledge based on their portraits and the data in Chapter 8. They are enthusiastic in their descriptions of physical stop-motion animation, such as *Soup Opera* shorts, and virtual animation, such as *Shrek*, and online computer games, such as *WoW*. Their high level of interest and ICT experience appears to predispose them *positively* to learning animation, as they are interested in animated texts and in using software. But this also leads to apparent misunderstandings, for they confuse virtual and physical animation and Dea, for instance, talks of filming the animated film as if it is live action. Dea has been an assistant for her father on film sets and therefore, familiar with shooting live action film. Emil and Dea have not tried stop-motion animation with physical objects before and it appears that their frame

of reference for production is digital animation. Both discuss their confusion about animation in the interviews. In a related vein, Emil talks of mistaking a function in the software, and he briefly thinks he has invented a new use: "super program that could distinguish and see whether it was skin or living...."

These two students verbalize their frustration with the instruction, Emil calling it "amateurish" that the technical aspects of filmmaking were not clear (see Chapter 9 for pedagogical discussion). Emil and Dea have a high degree of experience with ICT and transfer a partial or patchy knowledge of editing from gaming and knowledge of CGI virtual animation. Therefore, they approach the tasks of the physical stop-motion animation with misleading or high and *false* expectations from their experience and basic knowledge of filmmaking and virtual animation.

I had a discussion about the misunderstanding of animation with the art teacher. She suggested that the misunderstandings can be attributed to a lack of instructions about the software program and that the confusion was also an indication of their learning gain, i.e., students realizing that animation is broad and complicated. This may be true. But I attribute the misunderstandings of Dea and Emil to their high level of prior experience with digital media. I conclude that some of the students are *very familiar* with digital affordances from their use of software (such as for editing music), and that they know the basics of the CGI animation of games, films, etc. Therefore, they become more frustrated by what they call the "amateurish" instruction and software. Other students, such as Anna, are *less familiar* with digital affordances or are even negative toward digital technology. The teachers themselves may not have had understanding of how deeply some of the students are influenced by prior concepts and expectations of digital editing. Also, both teachers are not technically oriented.

I conclude that such differing attitudes toward technology *may have been maintained* or even perpetuated in this study because the computer-based editing issues were not resolved in the classroom. But altering entrenched negative learning attitudes and patterns is complex (see also implications in Chapter 13). I follow Dewey's view on how the chains of experience that an individual gain over a lifetime form the foundation and cognitive framework for approaching new experiences. Our attitudes and perceptions of technologies are constructed over time. A pragmatic consideration is therefore to encourage individuals to be open to inquiry and discovery and to overcome any entrenched attitudes or misunderstandings. Schools can support changing negative learning experiences to positive ones. Therefore, it is important to consider how to appeal to the less ICT-experienced students who may be motivated to use digital tools in order to realize their creative and artistic goals.

In the classroom, the students consulted with their teachers as coaches on animation practice and art-making. But the two teachers had a fairly low level of technical know-how. Yet, the DR observer was a valuable source of knowledge about sound editing. Some students applied their computing expertise to help each other solve technical problems in each group and between groups. I debate the overarching challenges facing schools in terms of integrating ICT and teaching multimodal art and media production in Chapter 13.

12.2. A Profile of Multimodal Design Competence

In the profile elaborated on the following pages, I consider competence in light of the overarching, normative discussions on literacy in Chapter 2 and the description of findings in this study. The three aspects that I apply refer to Burn and Durran's model of media literacy (2007) (reproduced in Table 1.1), which includes what they term a "trunk" of the emerging 3 Cs: cultural, creative and critical learning approaches within art and media pedagogy. My inspiration includes the four strata of semiotic processes (inspired by Halliday) of discourse, design, production, distribution (Kress & van Leeuwen, 2001), which are also applied by Burn and Durran. In addition, I incorporate the notion of the self-other-sign interaction (Figure 4.1). In Chapter 2, the term *reflection* was a fifth feature of media literacy discussed with reference to the double process of transformation. My understanding of the aspect of reflection combines the dialogic critical and aesthetic perspectives within media literacy. The notion of reflection applied here refers to my integration of theories on the double processes of inner and outer sign-making shown in the Animating Symbols model (Figure 1.1).

One of my aims with including reflecting in my research question was to explore the students' abilities to interpret or read signs, including how they might deconstruct the grammar and codes of a multimodal text. I view reflection as related to the students' creative abilities, which includes generating ideas, and composing and modifying ideas, as they are making semiotic choices during filmmaking.

Multimodal design competence is presented in my attempt at a profile of positive learning as integrating three aspects: *cultural, creative and reflective*. I view the week-long filmmaking course as potentially developing this kind of multimodal design competence. The profile of the aspects of multimodal design is empirically driven and attempts to collate my findings.

The three aspects of multimodal design competence are outlined here and then elaborated:

1. *Cultural,* which concerns how the individual develops an understanding of self and identity, which develops in relation to others, to culture and history

2. *Creative,* which refers to designing as a semiotic process of reinventing language and which concerns the active, creative design process of multimodal sign-making. This can also be called the ability to author texts. The creative aspect includes composing ideas that transduce from one mode to another in a film and developing expertise with the technical side of production.

3. *Reflective,* which concerns the inner cognitive processes that always are in a dynamic with the outer representations. Reflective processes refer here to the aesthetic aspects and critical dimensions of reflecting on others, on texts and on our "self." It includes the roles (or divisions) of labor in the film groups.

The following elaboration of the cultural, creative and reflective aspects is generated from the data presented in the thesis, including the video data, the evaluations done with teachers and the interviews with students. Describing competence or learning attained is difficult for the students to recognize or verbalize and is based on my analysis and evaluation. The aspects of competence coexist as a unified concept of multimodal design competence. After presenting the three aspects further, the chapter closes with a final discussion of the notion of competence.

12.2.1. *Cultural* aspect.

The individual student is designing and thereby, evolving an understanding of "self" and identity in their ongoing interactions with other people, with culture at large and with their sense of history. The students' use of symbols as metaphors and humor in the films as related to issues of identity were discussed earlier in this chapter. As Bruner suggests, people's inner worlds are shaped by the patterns of daily cultural life through the stories we tell, listen to and share as *cultural narratives*. For instance, the students in the film group *Out-breakers* discuss their childhood and stories relating to their inner stories about toys, imagining them as alive (in Window 3, Chapter 3). Out-3 relates how they made their semiotic choice of using pencils in their animated film: "We have chosen to symbolize the pencils that then start to come alive" to her childhood imaginings of teddy bears coming alive or her personal stories with toys. The *Out-breakers* film has inter-textual references to many other films, such as *Saturday Night Fever* and*Soup Opera*.

This exemplifies the power of narratives in terms of a cultural competence of drawing from a variety of sources for stories. Learning to compose multimodally involves a process of adjusting intentions, negotiating emergent meanings and finding one's way as an author. The cultural aspect refers to the ability to transform the power of many types of stories and

to utilize stories in an era where it is increasingly important to be able to communicate through multimodal stories; consider for instance, the popularity of YouTube.

12.2.2. *Creative* aspect.

Creativity is related here to design as reinventing language (referring to Kress, 1997). Designing is seen as an active semiotic process that is creative, technical and multisensory. It refers to synaesthetic notions within social semiotics and pragmatism (and phenomenology). This creative design aspect thus refers both to aesthetics and technical abilities, also described in the design and production strata of semiotic processes by Kress and van Leeuwen (2001). The creative aspect encompasses the ability to shift and transfer between different modes and semiotic systems, as well as the ability to be sensitive to the forms and qualities of each mode. This sensibility is embodied as actions in the here and now and arises from embodied experience (as Lakoff and Johnson discuss it). Interaction with various types of tools and materials has aesthetic implications, as form, media and content are inseparable, as per Dewey and the pragmatist tradition.

Learning to compose multimodally is challenging creatively because the students struggle to achieve the semiotic unity or rhythm of the time-borne medium of film, which is a first experience for many of the students. The students are thus learning to compose with time and across modes in all phases of film production. For instance, they draw storyboards in the pre-production phase, adjust camera settings and lights in production phase, and re-evaluate the ensemble of sound and image in the editing process in the post-production phase, etc. There are critical, changing events when they have to track a different semiotic pathway. Composing involves a selection of resources and determining which meanings are to be shown with the use of signs or representations and how the composition of an aesthetic or semiotic whole is achieved. For the untrained amateur, visual grammar is known implicitly, but can be difficult to explicate and use for aesthetic effect. Dewey (1934) suggests that aesthetic sensitivity can be trained.

The students redesign using a resemiosis of historical cultural discourses, exemplified in the mix of historical architectural landmarks and the ancient saga chosen for the *Metamorphosis* animated film. This group is challenged by choosing the apt ensemble of modes to integrate moving images, sound, and visuals. They re-edit the complex audio in the last hours of the post-production phase. Tools such as editing software make this type of process possible. The students' attitudes and prior understandings of the actual logics of the technologies for filmmaking impact learning. Filmmaking is complex and demanding, as exemplified by the onion skinning and calculating the frame rate. For example, Anna and Celia in the *Metamorphosis* group try out and demonstrate running movements and they

practice crossing the virtual and physical realms when animating (see Window 1 data in Chapter 8). The group discovers how to apply onion skinning and understand it affords much greater control over animating motion and a more efficient work process. Later, Ben reports using an illustration in *Cracking Animation* (Lord et al., 2004, pp. 144-145) to aid in visualizing running motion as a sequence. Animating the running requires a set of technical expertise. The students were working out factors of frame rate, and the tempo of acceleration and deceleration of running.

The creative aspects of design are seen as related to expressive and technical abilities as well as to trans-disciplinary thinking. For creativity is also about exercising multiple logics, such as employing concepts from mathematics or physics of the kind that are necessary to work out the physical and virtual animation of running. See considerations about training creativity and trans-disciplinary thinking in Chapter 13.

12.2.3. *Reflective* aspect.

The inner process of reflection refers to the transformation of previous learning and this is an intangible, ongoing and complex learning process that is recursive, as reviewed in Chapter 4. Integrating learning experiences builds on previous learning and sets in motion further integrations of experience. Developing reflection in relation to multimodal design can be seen in this study only through a short time span of the processes occurring during filmmaking and subsequent interviews. These are just one step in what are potentially cycles of reflection on a wide experience with representations in our everyday lives, including the codes, signs and meanings of mass media and communication.

The filmmaking at the school was group labor; involving social patterns of positions or roles in an interaction order. The students draw on each other's capabilities in the group work, and integrate interests and competences they already have; that is, prior expertise with for instance, drawing, gaming, designing, composing music, etc. The social dynamics in the film groups appear in the hierarchies of roles, where the highly influential roles of storyboarder, instructor and techie are at the top. There was a notable difference in group leadership style that leads to questions of how social dynamics in a group influences who makes the semiotic choices. Learning is collaborative in the sense that people interact with each other in filling signs with meaning.

Most of the students appear able to represent and articulate discourses about their own cultures and to enter into discussion of quite existential issues, such as the meaning of meaningfulness in their film texts or texts in their environment. For instance, Ben and Emil are both explicitly critical of how campaign posters and magazines may manipulate, which

Ben refers to when he expresses his political ideologies in relation to education, the arts and media. The reflective aspect implies that people continually interpret texts as part of interacting and communicating in everyday life. We explore discourses in a general sense through our specific, mediated actions using signs. Reflection involves a double process of transformation (inner and outer sign-making).

But, I wonder how the students reflect on where their own notions of media and art come from? Are they aware that they are performing relational discourses about society, aesthetics and technology? The short time span of the study and my methodology gives me limited insight into how their meta-reflections might develop over time.

12.2.4. Discussion of developing competence.

The learning *potential* for developing competence is omnipresent, for learning is a lifelong process and thus occurs everywhere, whether positive or negative, or in a formal or informal context. So, what can I conclude about *potential* for positive learning? I base my conclusions on the parameters of my research design and the frame given for the agents, and practices and the context of one school as I cannot evaluate the development of competence or trace an ongoing competence development.

There are, however, specific teaching practices that indicate to me how reflection may be supported by dialogic interpretation, such as eliciting learning dialogues about the ongoing transductions of storyboarding and films. Examples in the case study include when discussions of semiosis unfolded during filmmaking, the critique session and my interviews.

The conclusions from my data analysis of these dialogic actions in the classroom focus on what I view as *potential* and also missed opportunities. The students did not just learn to do film on their own but received instruction. In my opinion, however, the teaching approach could have been facilitating more dialogic reflection that actively integrated the students' multiple voices and interpretations. The storyboarding was exemplified here. It would also have been worth considering, for example, how it would have been possible to structure the critique session to get a more dialogic approach to feedback from the students, or how a film premiere might offer critique from a wider audience.

As mentioned in Chapter 5, the art teacher and school principal reported back to me that the class got a boost, especially socially, subsequent to the case study. I am not claiming this is due directly to participating in this case study. Perhaps it is attributable to doing any kind of special activity as a class where outsiders enter the school. The reported boost nevertheless brings up questions about the *potential* for developing competencies through

group-oriented projects, such as this one involving animated film production processes and the dissemination of films on a Web site (in this case, www.dr.dk).

13. Implications and Perspectives

This chapter on implications and perspectives is where I air my assumptions and opinions about how visual art and the rise of multimodal digital media affect the development of competence, transformation and identity of youth. I venture to present these perspectives pragmatically and to apply this study to the debate about educational practice and policies. I also discuss any loose ends, hypotheses and larger social issues that were not suitable for discussion in relation to the data, but that I find relevant and valuable to address for further debate.

Philosopher Bruno Latour has a model with a metaphorical black box (see Stafford, 1998) containing deeply held assumptions that are nevertheless in need of reconsideration. With regard to this study, my black box holds assumptions about how creating and interacting with visual signs and symbols, the material and the embodied, holds power and fascination for us as human beings. I also explore a black box filled with what society at large assumes about the visual, material and embodied domains of knowledge. I explore these boxes because it concerns me that visual signs and symbols appear to be given so little status and power in a setting such as upper secondary schools in light of how visual signs and symbols have so much status and power in the everyday media culture today, especially for youth. I attempt to present some of the paradoxes that I find in these two black boxes in this chapter.

In my black boxes are working hypotheses for this study: the everyday multimodal discourses that we humans utilize for communication constructs our understanding of our culture and self in a dynamic interaction. Our communication can be said to be interwoven with the multimodal media or tools we use. My conclusions build on the premise that communication processes and texts are always undergoing transformation and resemiotization, such as how texts pay homage to past works. I assume that digital technologies readily afford the appropriation of texts and remixing across media platforms. I also assume that visual and physical material processes, such as storyboarding on paper or acting out the motions of running in order to work out virtual animation, are important for the transformation of internal and external signs. This interaction between the physical and the virtual, the internal and the external, are interwoven in my understanding of discourse.

In regard to the other black box of social discourses about multimodality, I explore perspectives about the rise of a more visually oriented digital media culture. What are the implications of the visual turn for academia, educational policies and schools?

I am particularly interested in the importance of critical reflection about multimodal media in schools. In my opinion, educating young people to read, write, to be creative and inno-

vative and to use ICT in the future is related to reflection using multiple modes of signs and symbols.

This chapter presents further perspectives on multimodality in academia, in education policies and in the social institution of schools. I offer considerations about changing attitudes and practices toward multimodal media in school.

This chapter is divided into the following three areas:

1. The implications for academia regarding the status of multimodal texts as knowledge.
2. Perspectives on multimodality in relation to educational policies.
3. The role of schools for art and media production and the dilemmas involved, including ethical ones.

13.1. Implications for Academia: Bringing in the Multimodal

I explore some of the implications that a multimodal approach raises for all levels of education and practices and for the hierarchies of knowledge within the academic discourse. The theorizing and practices of multimodality, including the visual, embodied and objects are somewhat suspect within the ranks of academia. I believe this has consequences for other areas of education. Dewey (1934), Kress (1997), van Leeuwen (2005), Lakoff and Johnson (1980) discuss that our conceptual and metaphoric thinking is bound by our bodies. In my view, it is time for academia to reconsider the black boxes of values regarding thinking, learning, communicating and reflecting across multiple modes of communication. The concept of synaesthesia may inspire academic practice to harness opportunities for using multiple modes in our communication.

An example of academic communication is the almost monomodal (written word) standard format of a PhD thesis. My thesis does offer visual data of student films, and includes tables and models, but I stay within the modal convention of words. I will use this here to exemplify several paradoxes in academia. For a PhD thesis, for instance, visuals are an added bonus, according to my understanding of current Danish and international standards. I assume that this thesis is judged on my ability to communicate through *written words* as proof of scholarly practice.

Yet, one of the implications of my study is that sensory perception and designing concrete artifacts (things or texts, such as films) is a primary way of actively learning (doing and

thinking are parallel). I believe that each mode and each sense has special qualities; for example, writing a scholarly thesis exercises logical thinking and it is an excellent form of communication. But I propose expanding the notion of what an academic text is, so that multimodal texts can gain credibility as such knowledge is worth consideration. The status of visual and embodied experiences and representations can increase within academic practice, for example, by expanding the format of the PhD thesis, and by encouraging a multimodal approach to courses and conferences. This expansion would lead to more debate about how modes have historical status as knowledge within the academic ranks. I realize that I am generalizing in relation to some academic disciplines (such as art) that have always been multimodal and that academic teaching and presentation practices have been changing rapidly over the last few years.

13.2. Considerations for Educational Policy

The perspectives I consider here concern *educational policy*, which harkens back to the academic status of the visual and other modalities. I view policies with regard to the challenges of the visual turn and the rise of visual forms of communication and mass media in everyday culture as affecting policies in different ways. I remain skeptical of seeing any "new" media or mode as an ideal form of communication to be used by everyone and for everyone. Nevertheless, new visually oriented media are changing prevailing forms of work, governance and schooling and pose challenges for educational policies. The focus on reading and the written word as a monomodal school tradition of literacy is being challenged by the rise of digital media. The debate on expanding the view of literacy was discussed in Chapter 2, including new literacies movement. I agree that the *visual* aspects of semiotics in terms of literacy or multimodal competence should be reconsidered in higher education, in particular filmmaking (discussed in Messaris, 2001).

Visual signs and symbols have had lower status and have been considered less valuable, even untrustworthy historically, as discussed by art and media historians Mitchell and Barbara Maria Stafford (Mitchell, 1995, 2005; Stafford, 1998). There has been a paradox that digital technology often has high status in educational policy, with characterizations of youth as technologically savvy individuals who are almost intuitively able to work with a computer, and that schools (and teachers) were holding them back. Some of this rhetoric underlies educator Seymour Papert's ideas as well as early Constructionist learning theory dating to the onset of computers (Papert, 1980). Papert proposes that bringing computers into classrooms would lead students to doing creative experimentation and increase the learning outcome. My suggestion differs. I suggest that a multimodal and visual culture

approach in education can be integrated into the arts and sciences areas and promote creativity and reflectivity. I view school as a valuable forum for reflection that can integrate technologies for visualizing and communicating ideas, thereby preparing students for the so-called creative or knowledge society.

13.2.1. Reports on the role of digital technologies in school.

Below, I refer to a few international reports on policy in the field that support my view that multimodal media production in schools holds rich potential, especially for supporting the creative processes. Today, we have widely available tools allowing amateurs to author films, but as concluded in Chapter 12, millennial youth show varying levels of competencies, especially regarding using ICT (Pedró, 2006). The imbalances open up questions of digital divides (see Barron, 2004). Who gets opportunities to become media literate? How might the imbalance impact on preparing young people for participation in a future society, where being media literate, creative, innovative, flexible and critical presumably will be a criterion for success?

Pedró (2006, pp. 13-15) points out the relevance of millennials to the knowledge society. He critiques current efforts and proposes innovative responses and policy implications. Pedró voices a concern that efforts to design innovations in teaching processes and activities make some impact on student learning, but in general policies do not seem to have considered what would best suit the characteristics of millennials, with a few exceptions. He advocates finding and analyzing innovative educational responses in terms of the changes occurring in *students*. I agree with Pedró in stressing that policies should focus on building continuity between student lives in and out of school and assuring that student voices are heard.

Implications for schools are proposed by Pedró that revolve around four axes:

1. Infrastructural (more ICT devices and initiatives, such as podcasts)
2. Contextual (a more functional and flexible arrangement of learning activities)
3. Curricular (welcoming new cultural tools that integrate new media contents and platforms)
4. Process-focused (accommodating changing teaching and learning processes and roles, so that students integrate ICT-related competencies in class)

I back up a suggestion by Pedró to create incentives for cultural institutions (such as museums) and industry to produce educational materials based on the principles of what makes digital communication appealing to youth. The appeal needs to be tuned to the variety of attitudes young people have about ICT, digital multimodal production and the arts, as

indicated, for example, in my sample. This includes addressing gender difference by looking at the design of technologies (see Rommes et al., 2004; AAUW, 2000) as mentioned in the literature review. Based on this study, the arts and creative processes appear to have potential for closing the gender digital divide.

13.2.2. Discussion of how multimodal texts are framed in school.

I discuss here a few points from the ongoing debate about the status of multimodal texts as framed in schools today. Again, I question the values attributed to the multimodal, including how art, mass media and creativity fit into a school discourse with the traditions of divisions between subjects, grading and so on, as seen in relation to educational policy. I cannot go into depth with these issues here, but offer a few ideas that may have bearing on the production of digital multimodal (or multimedia) texts in schools.

As mentioned above, there is a paradigm shift underway due to the transition from a focus on the written word to the visual as a mode of communication, a shift toward a visual culture made possible by digital technologies. Kress (2003) notes that the transition currently taking place from a teaching and learning culture shaped by the primacy of the printed word and spoken language can (and should) lead to different educational practices. This transition obviously brings up many questions about the assumptions of education and learning, which are widely debated in education and by policy makers.

As mentioned in the literature review, notions of creativity differ in relation to school subjects and the materials used differ between the arts, media studies, hard sciences and ICT-oriented subjects. In regard to creativity research, there is a rising interest in understanding the social context but difficulties in evaluating creativity (Amabile *et al.*, 1999; Loveless, 2003, 2007; Sefton-Green, 2000; Sinker, 2000). I propose that the traditional visual arts subject in schools has the potential for broadly supporting creativity, but arts subjects are often marginal and are losing ground in schools, such as in the case of obligatory art classes in upper secondary Danish schools. The visual culture approach, with its concern for all visual phenomena, from what may be seen as elitist art to populist media, overlaps with art and other subjects and can be integrated into the usual curriculum, including production oriented film and media studies, IT and theory oriented subjects such as Danish, etc.

In conclusion, there are many paradoxes to consider in the traditional division of disciplines when considering revising educational policy across the educational system. Problems exist concerning instrumentation, marginalization and divisions along media lines, including the arts and their tradition of a physical, sensual aesthetic and elitist baggage. On

the other hand, problems also exist with the notion of computers in schools as "new" media that can answer the challenges that schools face today given the rhetoric of promoting creativity in schools (discussed in Banaji & Burn, 2007). I would argue for considering a cross-disciplinary visual culture and multimodal approach that integrates the affordances of physical and virtual types of semiotic tools.

13.3. The Role of School for Art and Media Production

I now turn to consideration of the role of upper secondary schools, in particular, for art and media production and practical applications. Good arguments exist for providing opportunities to author multimodal texts because a school context has the inherent value of being able to reach all types of students and to scaffold their reflective processes onto semiotic resources, ranging from pop to elite culture.

I do not go into a discussion of specific issues in the Danish context or curricular design, as they are beyond the scope of this thesis. But I exemplify practices from the *gymnasie* curricula in upper secondary Danish schools to illustrate a few points; I mainly refer here to the college preparatory curricula in upper secondary schools.

I use a broad brush to paint a general picture of schools and the development of young people's reflectivity and identity today. This picture is painted within my Danish world, but I see this as extending to the European and English-speaking countries because school systems and the problems of educating youth in a postmodern culture are comparable, international issues.

For the sake of argument, I review reasons why schools should and should *not* play a strong role in offering a context for developing multimodal texts. These reasons emerge repeatedly in discussions with teachers and in the literature. Thereafter, I discuss ethics, the role of teachers, and the integration of visual and multimodal digital media culture in schools.

13.3.1. Considerations for offering multimodal production opportunities in schools.

Below, I present arguments for offering multimodal or multimedia production in schools. My aim is to suggest various considerations for schools and reasons for introducing more production within schools in general. The presentation is divided into five issues: (1) student competence, (2) simulated practice in the classroom, (3) the role of teacher as coach, (4)

the school's discourse about creativity, and (5) trans-disciplinary practice in schools. I highlight the possible pros and cons of multimodal or multimedia production for further debate.

1. One reason for schools to offer practical multimodal production is that it involves developing students' *competence* (referring to the three aspects of *cultural, creative, reflective* presented in Chapter 12). In terms of the cultural aspect, there are psychological dimensions of identity to consider because the design process may involve personal stories and emotional intensity (Drotner, 1999). I argue that school can be a relevant context for personal work with the production of narratives, but I favor taking a dialogic perspective on productions and addressing them as cultural narratives, rather than as personal expressions. An important issue is how schools balance the domain of privacy and the public sphere; storytelling also presents ethical issues. There is the risk that film production can become too personal as a self-realization project that is inappropriate in schools. This issue is discussed below (in Chapter 13.3.2).

2. Another reason for schools to offer practical multimodal production is that it offers a *simulated practice* of work life (Schön's simulacrum), with *active and messy* multimodal, project-oriented group practices. Danish schools have a tradition for group projects, especially in primary school, but less so in secondary school, especially in the more academic *gymnasie* curricula (although this is changing). The academic curricula focus on individual projects, tests and exams. A great deal of educational research points out and debates the dilemma that schooling refers to its own school standards of testing and progression, and perhaps not to indicators for broader, *lifelong learning*, which in turn is methodologically challenging to measure (Pedró, 2006; Sefton-Green, 2004). There may be potential gains for schools as a context for engaging students in creative group activities, as in this case study, where the principal and teacher talk of the art class students as getting a boost. Project-based group work in schools could train students for dealing with future professional work situations involving negotiating semiotic processes and group dynamics.

3. Another reason for schools to offer practical multimodal production regards how *the teacher takes on the role of a coach*. A coaching role presents challenges that are similar to that of being a consultant. Teachers play a strong consultancy role, helping students to maintain an overview of their own work process in relation to the objectives of the class. There are numerous issues involved when defining teachers as coaches; for one, teachers have authority and also give grades, while,

in principle, coaches do not judge. Altering roles in the classroom is not so simple; for example, students may be more proficient technically than the teachers. The teachers would need to adapt the curriculum and perhaps, revise their attitudes and participate in media training to gain confidence.

4. Another reason for schools to offer practical multimodal production is that promoting *creativity* is high on the educational policy agenda. However, I suggest that a school needs to first discuss its own discourses and values around creativity and how to create the best premises to support student creativity. For instance, multimedia production might be considered frivolous, superfluous or irrelevant by students, teachers and schools. (There was some of this attitude in this case study.) The premises for offering more creative activities in school may not fit well with the real-life challenges confronting teachers, who must meet curricular standards, or the students, who are trying to get good grades and pass exams. An activity such as film production may seem difficult to relate to meeting such standards and grades. Therefore, it is important that the school believes in the activity as valuable and that creativity is an agreed upon goal in the school. It also seems important to be clear about assessment and evaluation of the activity within the usual framework for grades, etc.

5. Another reason for schools to offer practical multimodal production is that it offers an opportunity to think *trans-disciplinarily*. Cutting across school subjects and disciplines ideally blends newer and older types of media, rather than maintaining distinctions. For instance, using animation can cross into working out locomotion principles in physics or visualizing cells in biology. The presentation of an essay for sociology or ancient history can integrate older and newer film footage. The students' inquiry process and communication of findings can integrate multiple modes. The fact that combining words and images is useful in teaching practice is not new because different kinds of sign systems "can supplement each other" (Raney & Hollands, 2000, p. 25).

In summary, the status of disciplines and subjects in schools are part of long-standing hierarchies of sign systems, traditions and policies. If we want to support trans-disciplinary thinking and creativity, it is worth reconsidering how schools allow for more time to experiment with creative activities, such as filmmaking. Creativity is more likely in contexts where there is an interest in supporting it, otherwise people stay with the necessary tasks, as it requires too much effort to be creative (discussed in Csikszentmihalyi, 1996: pp. 8-9). Considerations about how to provide creative support is relevant and deserve more attention than I can give here. The need to follow a certain curriculum and evaluation form may

impede on having time for creative ideas. Teachers' training is an important issue. Problems with scheduling, old school buildings, that have incompatibilities in equipment and a lack of IT support, may also make creative activities such as digital multimodal production in schools challenging, as discussed previously.

13.3.2. The ethical boundaries: self-realization in school?

As discussed above, one serious issue regarding multimodal production in schools concerns ethical boundaries. Danish educational philosopher Svend Brinkmann cautions about going too far with self-realization in our work life and in our institutions, such as schools (Brinkmann, 2005). Self-realization refers here to the drive for inner, psychological development and fulfillment, a movement that has been on the rise for the last 50 years. One point of criticism concerns capitalizing on the personal content in filmmaking in school, because filmmaking can go beyond the boundaries of school.

As reviewed in Chapter 1, findings from media research indicate that millennial youth are increasingly using media outside of school by, for example, joining on-line communities, playing commercialized games, showcasing films on YouTube, etc. This phenomenon raises questions about what a school context can offer as an environment for a dynamic learning process with digital media, and yet not go beyond ethical limits. Story-worlds, to use Bruner's term, about narrative identification and environments may be shaping the psychodynamics and theories of the world by young people (Bruner, 2006). Story-worlds can be seen as psychological and as belonging to the private domain. Consider, however, the numerous story-worlds students are involved in outside of school, such as *WoW*. In my opinion, schools serve the purpose of being a forum for reflecting on story-worlds and producing their own stories.

Vygotsky (1986) would probably argue that the individual mind cannot be understood in isolation from our use of tools to alter our own inner world, to represent our worlds, and to alter the world around us. The complexities of symbolic language are in a sense provided to us as individuals by society as tools for thinking. Schools are public, social institutions run with public funds and subject to public policies.

Given the premise of protecting an individual's integrity within the boundaries of schools, I also have concerns about the ethical boundaries for producing stories with digital media in schools. Is the ethical situation different concerning doing multimodal media production than in any other context, and if so, how? How can possible personal content and meaning in media production be integrated into schools in an ethically responsible way? The ethical dilemmas cannot be solved here, but are left for further debate.

13.3.3. The role of teachers in integrating media production.

Since the main focus of this thesis is on the students, I touch only superficially on the important role of the teacher. Based on my findings, teachers are invaluable for promoting (or scaffolding, the Vygotskian term referring to framing or structuring) the reflection process and upholding positive learning. Dewey was critical of an *overly progressive* education in the sense of how some of his followers advocated free education, i.e., based strongly on the individual's motivation. Dewey argues that students do not have the capability of structuring their own learning experiences (Dewey, 1938; Fieser & Dowden, 2006). The role of the teacher is to structure activities and encourage students, for example, by helping them to find and stay on their narrative path when making a film. The teacher as consultant or coach can guide in solving problems ad hoc and frame an ongoing process of reflection. The notion of working from a dialogic reflection process implies having a forum for response and critique, which the teacher ideally frames. Instruction and the social dynamics in teacher-student and student-student relations play a major role in a positive learning experience and in attaining a dialogic type of reflection in the classroom, where students manifest learning experiences.

Burn and Durran (2007) conducted animation and other film production studies in schools and corroborate the impact that teachers and a school context can have in developing student reflection. They found that practical experiences can contribute to discussions among students about the construction of film, for example, the children become explicitly aware of continuity editing, which is a film term concerning the fragmentation of a representation of the world from different viewpoints and the reconstruction of the fragments as a film. Continuity editing "might be assumed to be invisible to children" (Burn & Durran, 2007, p. 53), which, of course, is the intention of continuity editing. Burn and Durran point out that children around 10 years of age implicitly begin to understand continuity editing. They conclude that children arrive at school with a partial sort of media literacy and suggest that film production in schools has a role in guiding students to develop a conception of the language or conventions of media, its grammar and codes (Ibid.). Their results point toward how children have a great deal of implicit knowledge of how media texts work but lack compositional understanding in terms of explicitly utilizing filmic conventions and reflecting on how an audience might read their film text (see similar discussion in Messaris, 2001).

In my study involving students in their late teens, I find a great awareness of filmic conventions and concern for the audience. Nevertheless, even these much older students struggle to compose their semiotic code and to weave the audio and visual modalities together. This leads me to argue for offering iterative opportunities for inquiry, production and reflection

about meaningfulness expressed in media and art in schools. Reflection occurs in an ongoing cycle in a lifelong learning process, as Dewey, Kimbell and others point out.

13.3.4. The impact of learning materials.

The implications for learning materials are viewed here from a point of view on convergent media and communication technologies. I take a somewhat symmetrical view of inner and outer sign-making. Thinking and actions are bound up with the semiotic tools we are familiar with and millennials are generally more familiar with digital tools than are older people. Thus, the design, including media platforms and modalities, does not exist in isolation and is affected by factors such as perception, prior experience and the expectations of the users.

A learning model can be seen as applied to the design of learning materials. For example, *AnimationsØen* was designed from a model of multimodal and inquiry-based experiential learning. The site offers multimedia clips to demonstrate various animation practices as well as written texts on animation theory in an attempt to inspire students and teachers to actively try designing and reflecting on student films. Learning materials are not neutral tools; they carry a learning model and exist in practice within the whole ecology of the school context and for each individual. Learning materials are tools that can be adapted by humans in a process of irreducible tension, as Wertsch describes (reviewed in Chapter 2). Yet the fact that learning materials or any type of tools cannot immediately alter thinking has implications for how quickly we can expect new types of tools to be adapted in schools.

13.3.5. The problem of positioning multimodal texts in schools.

As Kress and van Leeuwen (2001) point out, the ongoing practice of studying different types of cultural texts is still divided up into discipline-based formats in schools and it is a problem that schools generally think monomodally. They refer to a generic type of school assignment, writing essays, as an example that is usually monomodal (Ibid.). How is writing an essay different from creating a film, whether it be a documentary, fiction, live action or animated film? An obvious difference is that filmmaking is not generic to school traditions and is hard to place in a given subject. A mainly monomodal approach with written and verbal signs and symbols prevails and as social semiotics argues, school subjects are traditionally aligned with the form of media employed, whether it be books, theater, television, cinema, and even the emerging field of digital culture (Ibid.).

The irony in these persisting divisions between disciplines in school is that digital media is so pervasive. Yet the traditional differentiations of media are dissolving and making way

for new hybrid subjects. The implications for schools include reconsidering the monomodal view of subjects and disciplines, learning platforms, didactics, and what is valued as a format for school work assignments by students and for examinations of learning. Again, such reforms are rapidly underway, yet remain disputed (discussed in Jewitt, 2003, 2005; Jewitt & Kress, 2006).

I offer here suggestions that apply to multimodal practices across school subjects. These practices are based on utilizing the leverage of simulated practices (simulacrum) and the work of Schön, who would probably see this case study as a simulation of practices based on learning how to think like an animator. The use of storyboards as a blueprint for transduction to film is similar to using models and blueprints like a city planner, architect or engineer. Implications for schools include working with visual representations that the students make themselves (such as geographic maps, mind maps, and 3D models) across the arts, humanities and hard sciences whenever complex visuals are relevant to communicate, plan, describe, model and interact. Visual representations offer valuable means for dialogic interpretations across subjects and disciplines, and, although using visuals is not a new practice for schools, it can be renewed by integrating professional high-end digital tools and simulated practices. (For similar implications about simulacrums in schools, see Schön and for using educational games, see Hanghøj, 2009; Shaffer & Clinton, 2006).

13.3.6. Implications of media education for democracy.

The implications of media education include considering schooling children and young people to participate in a democratic society because digital media harbor some vital issues about democratic development. Pragmatism is concerned with improving conditions for democratic action in society, including improving competence with media and critical reflection, which is discussed by contemporary pragmatists such as Shusterman, Joas, Kimbell and German media philosopher Mike Sandbothe (Sandbothe, 2005). In Denmark digital technologies are readily accessible to young people. But there are variations in their use and the students' *familiarity* with ICT, which I assume impacts their abilities to function as critical citizens.

Digital media literacy as defined by the European Commission on Information Society and Media is multimodal: "the ability to access, analyze and evaluate the power of images, sounds and messages which we are now being confronted with on a daily basis" (EU, 2006). These abilities are considered an important part of communicating competently in our contemporary culture and on a personal basis. Media literacy is also seen as empowering people: "…with the critical thinking and creative problem-solving skills to make them judicious consumers and producers of information" (Ibid.). Media education is discussed

as a basic entitlement of every citizen, related to freedom of expression and the right to information "and it is instrumental in building and sustaining democracy" (Ibid.). This civic perspective is a recurring theme in the critical traditions of media literacy (Buckingham, 2003).

The benefits of increasing the amount of media production in schools include the paths it constructs to and from popular culture and that it would expand what upper secondary schools can offer as a forum for multimodal, cultural interchanges. In keeping with this rhetoric, the losers would be those who have a limited modal range or competence, which would include only being able to read and write well with words, or only with number systems, or only with visuals. Those who are reticent about using ICT may encounter difficulties in accessing information and participating in the many digitalized communication platforms that are now part of civic life. Those who are less media reflective and competent may become less critical, thus easier to manipulate, and less able to negotiate living in a democracy. Other consequences can be that those in power have the access, competence and knowledge about media necessary to be powerful *authors*, and those with less multimodal media competence will lack *authorial power*.

13.4. Closing Remarks

Youth today are under a strong influence from ubiquitous presence of mass media and participate widely by generating multimodal contents on sites such as YouTube. They can potentially learn to interpret signs and symbols through making their own films and many other types of multimodal texts. As was seen in these animated films and other visual texts made by the 18-year-old students, they contain metaphors of meaning and are powerful narratives.

As Bruner argues, our minds, and our realities, are shaped to the patterns of our daily, cultural life and the stories we tell and share, whether true or fictional. We are active participants in our culture mainly through our own narratives (Bruner, 2006). He views iconic representation and the world of images as perhaps the most powerful way to arouse new ways of thinking and doing. Depiction is seen as part of an action-related mode of dealing with the world: "For images are not only prototypes of categories, but also stopped action frames in narratives" (Bruner, 1997, p. 158). The example of filmmaking has potential for schools because it involves making choices about representing and dealing with degrees of constructed reality. Discerning this construction of reality has been part of my discussion regarding how the students are reflecting on texts as animated symbols. The open and

polysemic quality of visuals woven into stories makes them a powerful means of communication that appeals to youth.

Young people growing up today have a high exposure to a visually oriented mass media, but they are not necessarily able to explicate how stories are constructed or exercise critical reflection. There are risks that digital mass media narratives (or story-worlds) are not reflected upon by students in school, but exist only outside of school under the influence of commercial interests.

I suggest considering learning by doing multimodal production based on a model of iterative, *dialogic processes of interpretation* in school. The *potential* for positive learning seems to be present when offering activities such as digital multimodal filmmaking.

There are risks involved in bringing the power of digital storytelling into schools and the ethics involved need to be considered. But if schools do not offer opportunities for reflecting on multimodal, creative media through theory as well as production, then inequities in the level of prior experience with problems of misunderstanding and low critical reflection may be maintained. I propose that there is the potential for developing multimodal design competence or literacy and the school offers a valuable arena for dialogic reflection. This can contribute to a lifelong learning process and the development of critically reflective, active citizens with creative abilities.

References

AAUW. American Association of University Women Educational Foundation. (2000). *Tech-savvy: Educating girls in the new computer age.* Washington, D.C.

Agger, G. (1999). Intertextuality revisited: Dialogues and negotiations in media studies. *Canadian Aesthetics Journal /Revue Canadienne d'Esthétique*, 4. On-line journal Retrieved September 1, 2008. From: http://www.uqtr.uquebec.ca/AE/vol_4/gunhild(frame).htm

Aguirre, I. (2004). Beyond the understanding of visual culture: A pragmatist approach to aesthetic education. *The International Journal of Art & Design Education, 23*(3), 256-269.

Amabile, T., Collins, M. A., Conti, R., Phillips, E., Picariello, M., Ruscio, J. (1999). *Creativity in context: Update to the social psychology of creativity*. Boulder and Oxford: Westview Press.

Andreasen, L. B. (2008). Brugeres stemmer i spil: Inddragelse og dialogformer i museers undervisningspraksis [The users' voices: Bringing users of museums into play through dialogic educational practice]. In L. B. Andreasen, B. Meyer, & P. Rattleff (Eds.), *Digitale medier og didaktisk design: Brug, erfaringer og forskning [Digital media and didactic design: Use, experience and research]* (pp. 86-107). Copenhagen: Danmarks Pædagogiske Universitetsforlag.

Animation Workshop. (2007). Retreived December 20, 2007. From http://www.animwork.dk

ASIFA. (1960/2006). *Website of the Association International du Film d'Animation (International Animated Film Association)*. Retreived December 2, 2007. From http://asifa.net

Bakhtin, M. M. (1981). *The dialogic imagination: Four essays* (C. Emerson & M. Holquist, Trans.). Austin and London: University of Texas Press.

Banaji, S., & Burn, A. (2007). Creativity through a rhetorical lens: Implications for schooling, literacy and media education. *Literacy, 41*(2), 62-70.

Banks, M. (1995). Visual research methods. *Social Research Update,* (11).

Banks, M. (2001). *Visual methods in social research*. London: Sage.

Barrier, C., & Clémençon, F. (1991, 2000). Soup opera [Soupe-opéra]. France: Marlou Films distributed to the Danish Broadcasting Corporation (DR). Shown on children's TV programs.

Barron, B. (2004). Learning ecologies for technological fluency: Gender and experience differences. *Journal Educational Computing Research, 31*(1), 1–36.

Bell, P., & Milic, M. (2002). Goffman´s *gender advertisements* revisited: Combining content analysis with semiotic analysis. *Visual Communication, 1*(2), 203-222.

Blumer, H. (1969). *Symbolic interactionism: Perspective and method*. Berkeley: University of California Press.

Braden, R. A. (1996). Visual literacy. In D. H. Jonassen (Ed.), *Handbook of research for educational communications and technology* (pp. 491-520). New York: Simon & Schuster Macmilliam.

Brinkmann, S. (2005). Introduktion [Introduction]. In S. Brinkmann & C. Eriksen (Eds.), *Selvrealisering – Kritiske diskussioner af en grænseløs udviklingskultur* [Self-realization-Critical discussion of a development culture without boundaries] (pp. 7-14.). Aarhus: Klim.

Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.

Bruner, J. (1991). The narrative construction of reality. *Critical Inquiry, 18*, 1-21.

Bruner, J. (1997). *The culture of education*. Cambridge, MA: Harvard University Press.

Bruner, J. (2006). *Narrative, learning and culture*. Copenhagen: New Social Science Monographs.

Buckingham, D. (2003). *Media education: Literacy, learning and contemporary culture*. London: Polity Press.

Buckingham, D. (2006). Defining digital literacy. *Digital Kompetanse, 1*(4), 263-276.

Buckingham, D., & Bragg, S. (2003). *Young people, media and personal relationships*. London: Research project funded by the Advertising Standards Authority, the British Board of Film Classification, the BBC, the Broadcasting Standards Commission and the Independent Television Commission.

Buckingham, D., Bragg, S., Grahame, J., Simons, M., Albero-Andres, M., Bouman, M. et al. (2003, September). *Expert report on the seminar: "Young people, sex and the media: New educational strategies."* London.

Buckingham, D., Grahame, J., & Sefton-Green, J. (1995). *Making media: Practical production in media education*. London: English and Media Centre.

Buckingham, D., & Willett, R. (Eds.). (2006). *Digital generations: Children, young people, and the new media*. Mahwah, NJ: Lawrence Erlbaum.

Burn, A., & Durran, J. (2007). *Media literacy in schools: Practice, production, progression*. London: Paul Chapman Educational Publishing.

Burn, A., & Parker, D. (2001). Making your mark: Digital inscription, animation, and a new visual semiotic. *Education, Communication & Information, 1*(2), 155-179.

Burn, A., & Parker, D. (2003). *Analysing media texts*. London and New York: Continuum.

Cameron, S. K. (1996). *Balancing the request to be good: An account of a visit to the outskirts of child psychotherapy*. Free Association Books, London.

Carter, S., & Mankoff, J. (2005). *When participants do the capturing: The role of media in diary studies.* Paper presented at CHI 2005 conference. CHI'05 Proceedings, 899--908.

Cassell, J. (1998). Storytelling as a nexus of change in the relationship between gender and technology: A feminist approach to software design. In J. Cassell & H. J. (Eds.), *From Barbie to Mortal Combat*. Cambridge, MA: MIT Media Lab.

Center for digital storytelling Web site. (2007). Retreived December 2, 2008. From http://www.storycenter.org

Clark-Ibáñez, M. (2004). Framing the social world with photo-elicitation interviews. *American Behavioral Scientist, 47*(12), 1507-1527.

Collier, M. (2001). Approaches to analysis in visual anthropology. In T. Van Leeuwen & C. Jewitt (Eds.), *Handbook of visual analysis*. London: Sage Publishers, 35-60.

Csikszentmihalyi, M.(1996). *Creativy. Flow and the psychology of discovery and invention.* NY: Harper Collins.

Dahms, M., Geonnotti, K., Passalacqua. D., Schilk, J. N., Wetzel, A., & Zulkowsky, M. (2007). *The educational theory of Lev Vygotsky: An analysis*. New Foundations G. K. Clabaugh & E. G. Rozycki (Eds). Retrieved September 1, 2008 from: http://www.newfoundations.com/GALLERY/Vygotsky.html

Danielsson, H. (2002). *Att lära med media – Om det språkliga skapandets villkor i skolan med fokus på video [To learn with media-On the situation for linguistic and creative production in school with focus on video].* Stockholm: Stockholms Universitet, Pedagogiska institutionen.

Davies, A. (1997). Assessment and transferable skills in art and design, Deliberations: Educational Development Unit at London Guildhall University.

Davies, A. (1999). *Using learning journals to identify critical incidents of understanding.* Retreived December 20, 2005. From http://www.cltad.ac.uk

DBRC. (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher, 32*(1), 5/8.

DBRC. (2005). The design-based research collective. Retrieved June 15, 2005 from http://www.designbasedresearch.org

Denzin, N. K. (1992). *Symbolic interactionism and cultural studies*. Cambridge: Blackwell.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. Boston, MA: Heath and Company.

Dewey, J. (1934). *Art as experience* (1980 ed.). NY: Perigee Trade, Penguin Putnam.

Dewey, J. (1938). *Experience and education* (Reprint 1997 ed.). New York: Free Press.

Documenta. (2007). Documenta 12. International art event held in Kassel, Germany.

Drotner, K. (1999). *Unge, medier og modernititet – Pejlinger i et forandreligt landskab [Youth, media and modernity-Directions in a changing landscape]*. Valby: Borgen/Medier.

Drotner, K. (2001). *Medier for fremtiden [Media for the future]*. Copenhagen: Høst & Søn.

Drotner, K. (2003). *At skabe sig – Selv: Ungdom, æstetik, pædagogik [To create one's self: Youth, aesthetics, pedagogy]*. Copenhagen: Gyldendal.

Drotner, K. (2004). Disney discourses, or mundane globalisation. In I. Bondebjerg & P. Golding (Eds.), *Media cultures in a changing Europe*. Bristol: Intellect Books. 91-115.

Drotner, K. (2008). Boundaries and bridges: Digital storytelling in education studies and media studies. In K. Lundby (Ed.) *Digital storytelling, mediatized stories – Self-representation in new media.* New York: Peter Lang. 61-84.

Eisler, R., & Montuori, A. (1995). Creativity, society, and the hidden subtext of gender: Toward a new contextualized approach. In A. Montuori & R. Purser (Eds.), *Social creativity* (Vol. 3). Creskill, NJ: Hampton Press.

Eisner, E. W. (2004). What can education learn from the arts about the practice of education? *International Journal of Education & the Arts, 5*(4), 73-79.

Ejersbo, L. R., Engelhardt, R., Frølunde, L., Hanghøj, T., Magnussen, R., & Misfeldt, M. (2008). Balancing product design and theoretical insights. In A. E. Kelly, R. A. Lesh, J. Y. Baek (Eds.), *The handbook of design research methods in education: Innovations in science, technology, engineering and mathematics learning and teaching* (pp. 149-164). New York: Routledge (Taylor & Francis).

Elf, N. F. (2008). *Towards semiocy? Exploring a new rationale for teaching modes and media of Hans Christian Andersen fairytales in four commercial upper-secondary "Danish" classes. A design-based educational intervention.* PhD dissertation. Institute of Philosophy, Education and the Study of Religions, University of Southern Denmark, Odense.

Erstad, O. (2003). Electracy as empowerment: Student activities in learning environments using technology. *Young: Nordic Journal of Youth Research, 11*(1), 11-28.

Erstad, O., Gilje Ø. (2008) Regaining impact: Media education and media literacy in a Norwegian context. *Nordicom Review 29* 2, pp. 219-230

Erstad, O., Gilje, Ø. & de Lange, T. (2007). Re-defining media learning—Multiliteracies and digital production in Norwegian media education. *Learning, Media and Technology, 32*(2), 183-198.

EU. (2006). *Audiovisual and media policies: Media literacy*. Retrieved January 7, 2007 from http://ec.europa.eu/comm/avpolicy/media_literacy/index_en.htm

Fairclough, N. (2005). Critical discourse analysis, *Marges Linguistiques 9* (76-94). Retreived April 1, 2008 from http://www.ling.lancs.ac.uk/profiles/263

Fairclough, N.(1995). *Critical discourse analysis: The critical study of language*. London: Longman.

Fieser, J., & Dowden, B. (2006). John Dewey (1859-1952): The internet encyclopedia of philosophy. URL: http://www.iep.utm.edu/d/dewey.htm

Fisker, T. B. (in press) Multimodal interaktion blandt småbørn. [Multimodal interaction between young children]. PhD thesis. Danish University of Education, Aarhus University, Copenhagen.

Frølunde, L. (2006, September). *Exploring context in relation to aesthetic practices: A case study*. Paper presented at DREAM Conference: Informal Learning and Digital Media: Constructions, Contexts, Consequences, Odense, Denmark.

Frølunde, L. (2008a, March). *Storyboarding animation film; A case study of multimodal production processes in a Danish upper secondary school*. Paper presented at Designs for Learning Conference, Stockholm.

Frølunde, L. (2008b, September). *Animated symbols: A model of reflection applied to a study of how young people author animation films*. Abstract and paper presented at DREAM 2nd International Conference Digital Content Creation: Creativity, Competence, Critique, Odense, Denmark.

Frølunde, L. (in press 2009). Storyboarding animation film: A case study of multimodal transduction, accepted for special issue on filmmaking, *Designs for Learning Journal*.

Frølunde, L., & Moser, T. (2004). A richly woven tale; Bodies in technology by Don Ihde. *Human studies; A journal for philosophy and the social sciences 27*(3), Kluwer Academic Publ., The Netherlands.

Frølunde, L., Gilje, Ø., Lindstrand, F., Öhman-Gullberg, L. (2007). *Multimodal perspectives on moving image production by young people – Four Nordic studies of transformative processes in the work with film*. Abstract with paper presentation at NordMedia 2007, University of Helsinki.

Frølunde, L., Gilje, Ø., Lindstrand, F., Öhman-Gullberg, L. (2008, September). *Methodologies for tracking learning paths in the making a filmmaker research study of young Nordic filmmakers*. Paper presented at DREAM 2nd International Conference Digital Content Creation: Creativity, Competence, Critique, Odense, Denmark.

Frølunde, L., Gilje, Ø., Lindstrand, F., Öhman-Gullberg, L. (2009). Methodologies for tracking learning paths: Designing the on-line research study Making a Filmmaker. *Mediekultur 46*(1), Spring. URL: www.mediekultur.dk

Frølunde, L., Israel, S. B., & Dam, J. (2007). *AnimationsØen [Animation Island]* Editors: DR (Danish Broadcasting Corporation). URL: www.dr.dk/gymnasium

Furniss, M. (1995). *Art in motion: Animation aesthetics*. Sydney: John Libbey.

Gauntlett, D. (2002). *Media, gender and identity: An introduction.* London and NY: Routledge.

Gauntlett, D. (2007). *Creative explorations: New approaches to identities and audiences*. London and NY: Routledge.

Gaver, B., Dunne, T., & Pacenti, E. (1999). Design: Cultural probes. *Interactions: New Visions of Human-Computer Interaction 6* (1), 21-29.

Gee, J. P. (1996). *Social linguistics and literacies: Ideology in discourses* (2nd ed.). London: Taylor and Francis.

Gee, J. P. (2004). *Situated language and learning: A critique of traditional schooling.* London and NY: Routledge.

Gibson, J. J. (1979). *The ecological approach to visual perception:* Houghton Mifflin.

Gilje, Ø. (2008). Googling movies—Digital media production and the "culture of appropriation." In K. Drotner, H. S. Jensen and K. C. Schrøder (Eds.), *Informal learning and digital media.* Cambridge: Cambridge Scholar Publishing.

Gilje, Ø. (2009). Making a filmmaker.Report for the Norwegian Media Council (RAM) Oslo. Retreived April 15, 2009 from http://www.multimodalfilmmaking.tk

Gilje, Ø., Frølunde, L., Lindstrand, F., & Öhman-Gullberg, L. (in press 2009). Mapping filmmaking; portraits of young filmmakers in Scandinavia using various contexts for learning filmmaking. In B. Arnolds-Granlund, O. Erstad, L. Högberg, S. Kotilainen, P. Lundgren, & B. Tufte (Eds.), *Media literacy and education: Nordic perspectives.* Helsinki: Nordicom & the Finnish Society on Media Education.

Gjedde, L., & Ingemann, B. (2008). *Researching experiences: Exploring processual and experimental methods in cultural analysis*. Cambridge, UK: Cambridge Scholars Publishing.

Goffman, E. (1981). *Forms of talk*. Philadelphia: University of Pennsylvania Press.

Goldblatt, P. (2006). How John Dewey's theories underpin art and art education. *Education and Culture, 22*(1), 17-34.

Goodman, N. (1976). *Languages of art: An approach to a theory of symbols*. Indianapolis, IN/Cambridge, MA: Hackett.

Goodman, N. (1978). *Ways of worldmaking*. Indianapolis: Hackett.

Goodman, S. (1996). Visual English. In S. Goodman & D. Graddol (Eds.), *Redesigning English: New texts, new identities* (pp. 38-72). London: Routledge and The Open University.

Halliday, M. A. K. (1978). *Language as social semiotic: The social interpretation of language and meaning.* London: Edward Arnold.

Halliday, M. A. K., & Hasan, R. (1985). *Language, context and text: Aspects of language in a social semiotic perspective*. Oxford: Oxford University Press.

Hanghøj, T. (2008). *Playful knowledge: An explorative study of educational gaming.* PhD thesis. Institute for Literature, Media and Culture, University of Southern Denmark, Odense.

Heise, Inge (1995): *Hvad sker der i klasserummet [What happens in the classroom].* Report for the Ministry of Education. Copenhagen

Heise, Inge (1998): *Lærerliv [The life of teachers].* Report for the Ministry of Education. Copenhagen

Hertzfeldt, D., & Judge, M. (2006). *Animation show at Siggraph ´06*. ACM Special Interest Group on Computer Graphics and Interactive Techniques. Retreived December 13, 2007. From http://arts.siggraph.org

Hull, G. (2003). At last: Youth culture and digital media: New literacies for new times. *Research in the Teaching of English, 38*(2), 229-233.

Hull, G. (2006, September). *Geographies of hope: Creating new spaces for literacy, learning, and community.* Keynote at the DREAM Conference: Informal Learning and Digital Media: Constructions, Contexts, Consequences, Odense, Denmark.

Hull, G. A., & Nelson, M. E. (2005). Locating the semiotic power of multimodality. *Written Communication, 22*(2), 224-261.

Iedema, R. (2001). Analysing film and television: A social semiotic account of hospital: An unhealthy business. In T. Van Leeuwen & C. Jewitt (Eds.), *Handbook of visual analysis*. London: Sage Publishers, 183-206.

Iedema, R. (2003). Multimodality, resemiotization: Extending the analysis of discourse as multisemiotic practice. *Visual Communication, 2*(1), 29-57.

Illeris, H. (2002). The field of visual arts education and its relation to the field of art. In H. Illeris (Ed.), *The field of visual arts education and its relation to the field of art.* Copenhagen: The Danish University of Education.

Illeris, H. (2006). Museums and galleries as performative sites for lifelong learning: Constructions, deconstructions and reconstructions of audience positions in museum and gallery education. *Leicester: Museum & Society*, *4*(1). Retreived January 5, 2009. From http://www.le.ac.uk/ms/m&s/vol_4,1.html

Illeris, H. (2008). Between visual arts and visual culture: Themes in Danish studies 1995-2008. In L. Lindström (Ed.), *Nordic visual arts education in transition.* Stockholm: Vetenskapsrådet.

Illeris, K., Katznelson, N., Simonsen, B., & Ulriksen, L. (2002). *Ungdom, identitet og uddannelse [Youth, identity and education]* (3rd ed.). Frederiksberg: Roskilde University Press.

Israel, S. B. (2006). Danish animation: The story so far. In S. B. Israel (Ed.), *Danima 06: The first Danish animation studies conference*. Department of Film and Media Studies, University of Copenhagen.

Ito, M. (2005). Technologies of the childhood imagination: Yugioh, media mixes, and everyday cultural production: In J. Karaganis & N. Jeremijenko (Eds.), *Structures of participation in digital culture*. Durham, NC: Duke University Press.

Ito, M., Callum, B., Saito, R. (2008). *Transnational anime fandoms and amateur cultural production*. [Abstract] Retreived January 3, 2009. From: http://digitalyouth.ischool.berkeley.edu/?q=node/12

Ito, M., Horst, H. A., Bittanti, M., Boyd, D., Herr-Stephenson, B., Lange, P. G., Pascoe, C. J., & Robinson, L. (with Baumer, S., Cody, R., Mahendran, D., Martínez, K., Perkel, D., Sims, C., & Tripp, L.) (2008, November). *Living and learning with new media: Summary of findings from the Digital Youth Project.* MacArthur Foundation, retrieved December 21, 2008 from http://digitalyouth.ischool.berkeley.edu

Jensen, H., Marshall, B., Parker, D., & Street, B. (2004). *Animated English final report (project evaluation).* Arts Council England.

Jewitt, C. (2005). Classrooms and the design of pedagogic discourse: A multimodal approach. *Culture and Psychology, 11*(3), 309-320.

Jewitt, C. (2006). *Technology, literacy and learning: A multimodal approach.* London: Routledge.

Jewitt, C., & Kress, G. (2003). *Multimodal literacy and Learning.* New York: Peter Lang Publishing.

Joas, H. (1996). *The creativity of action*. Cambridge: Polity Press.

Joas, H. (2000). *The genesis of values*. Chicago, Cambridge: University of Chicago Press and Polity Press.

Johnson, M. (1990). *The body in the mind: The bodily basis of meaning, imagination, and reason*. Chicago: University of Chicago Press.

Johnson, M. (2007). *The meaning of the body: Aesthetics of human understanding*. Chicago: University of Chicago Press.

Jones, R., & Norris, S. (2005). *Discourse in action: Introducing mediated discourse analysis.* London: Routledge.

Kahr-Højland, A. (2007). The mobile phone as a museum piece? Mobiles boding for a paradigm shift required in the Learning Museum Anno 2007. In H. Philipsen & L. Qvortup (Eds.), *Moving media studies – Remediation revisited* (pp. 121-143). Odense: Samfundslitteratur Press.

Katz, P., & Poulsen, H. (1997). *Fokus – En grundbog i film, TV, video [Focus-A guide to film, TV, video]* Copenhagen: Gyldendal.

Keogh, T., Barnes, P., Joiner, R., & Littleton, K. (2000). Gender, pair composition and computer versus paper presentations of an English language task. *Educational Psychology, 20*(1).

Kimbell, R., Stables, K., & Green, R. (1996). *Understanding practice in design and technology*. Buckingham: Open University Press.

Knill, P., Barba, H. N., & Fuchs, M. N. (1995). *Minstrels of soul: Intermodal expressive therapy*. Toronto: Palmerston Press.

Knobel, M., & Lankshear, C. (2007). *A new literacies sampler.* New York: Peter Lang.

Kress, G. (1992). Visual and verbal modes of representation in electronically mediated communication: The potentials of new forms of text. In I. Snyder (Ed.), *Page to screen: Taking literacy into the electronic era*. London: Routledge.

Kress, G. (1993). Against arbitrariness: The social production of the sign as a foundational issue in critical discourse analysis. *Discourse and Society, 4*(2), 169-193.

Kress, G. (1997). *Before Writing: Rethinking the paths to literacy.* London and NY: Routledge.

Kress, G. (2003). *Literacy in the new media age*. London: Routledge.

Kress, G. (2005). Gains and losses: New forms of texts, knowledge and learning. *Computers and Composition, 22*(1), 5-22.

Kress, G., & van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. London: Hodder Arnold Publication.

Kress, G., & van Leeuwen, T. (2006). Second edition. *Reading images: The grammar of visual design*. London and NY: Routledge.

Kvale, S. (1995). The social construction of validity. *Qualitative Inquiry, 1*(1), 19-40.

Kvale, S. (1996). *Interview: An introduction to qualitative research interviewing*. London, Thousand Oaks, New Delhi: Sage.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.

Lehtonen, M., & Herkman, J. (2002). Next stop: Multimodality—Report on the multimodality and culture conference 2001. *Convergence: The International Journal of Research into New Media Technologies, 8*(4).

Lemke, J. (2002). Travels in hypermodality. *Visual Communication, 1*(3), 299-325.

LeVine, P., & Scollon, R. (2004). *Discourse and technology: Multimodal discourse analysis.* Washington, D.C.: Georgetown University Press.

Lindstrand, F. (2006a). *Att göra skillnad. Representation, identitet och lärande i. Ungdomars arbete och berättande med film [Making difference. Representation, identity and learning in teenagers' work and communication with film]*. PhD thesis, Stockholm University. Stockholm: HLS Forlag.

Lindstrand, F. (2006b, September). *Evolving meanings and aspects of learning in the process of sign-making in film*. Paper presented at the DREAM Conference: Informal Learning and Digital Media: Constructions, Contexts, Consequences, Odense, Denmark.

Lindstrand, F., Frølunde, L., Gilje, Ø., & Öhman-Gullberg, L. (in press 2009). Interests in motion: The film medium through the eyes and lenses of young Scandinavian filmmakers. In J. Fisherkeller (Ed.), *International perspectives on youth media: Cultures of production & education.* New York: Peter Lang.

Livingstone, S. (2002). *Young people and new media.* London: Sage.

Livingstone, S. (2008). Internet literacy: Young people's negotiation of new online opportunities. In T. McPherson (Ed.), *Unexpected outcomes and innovative uses of digital media by youth* (pp. 101-121). Cambridge, Mass: The MIT Press.

Lord, P., Sibley, B., & Park, N. (2004). *Cracking animation: The Aardman book of 3-D animation*. London: Thames & Hudson.

Loveless, A. M. (2003). *Literature review in creativity, new technologies and learning* (no. 4). Bristol: NESTA FutureLab.

Loveless, A. M. (2007). *Report 4 update: Creativity, technology and learning – A review of recent literature*. Bristol: NESTA Futurelab.

Lowenfeld, V., & Lambert Brittain, W. (1975). *Creativity and mental growth* (sixth ed.). New York: Macmillan.

Lundby, K. (Ed.). (2008). *Digital storytelling, mediatized stories: Self-representations in new media*, New York: Peter Lang.

Manovich, L. (2001). *The language of new media*. Cambridge: MIT Press.

Manovich, L. (2006). Image future. *Animation, 1*(1), 25-44.

Manovich, L. , Hertz, B., Buchan, S. Derrick. (2007). *Animated painting*. San Diego, CA: San Diego Museum of Art.

MÆRKK. (2007). *Oplevelse. Æstetik i markedskommunikation [Aesthetics in market communication] Æstetik i markedskommunikation.*. Retreived April 5, 2007. From http://www.maerkk.aau.dk/oplevelser/oplevelse.htm

McCloud, S. (1994). *Understanding comics: The invisible art*. New York: Harper Perennial.

McDonagh, D., Goggin, N., & Squier, J. (2005). Signs, symbols, and subjectivity: An alternative view of the visual. *Computers and Composition, 22*(1), 79-86.

Messaris, P. (2001). New literacies in action: Visual education. *Reading Online, 4*(7). Retreived January 5, 2008. From http://www.readingonline.org/newliteracies/action/messaris/index.html

Miller, M. (2003). *Theories of media: Keywords glossary: Animation*. Retreived January 5, 2007. From http://csmt.uchicago.edu/glossary2004/animation.htm

Mills, C. W. (1959/1967). *The sociological imagination*. London, Oxford, Paris: Oxford University Press.

Mirzoeff, N. (1999). *An introduction to visual culture*. London: Routledge.

Mitchell, W. J. T. (1986). *Iconology: Image, text, ideology*. Chicago: University of Chicago Press.

Mitchell, W. J. T. (1995). *Picture theory: Essays on visual and verbal representation*. Chicago: University of Chicago Press.

Mitchell, W. J. T. (1998). *The last dinosaur book: The life and times of a cultural icon*. Chicago: University of Chicago Press.

Mitchell, W. J. T. (2005). *What do pictures want?* Chicago: University of Chicago Press.

Moghaddam, F. M., Harré, R., & Lee, N. (2008). Positioning and conflict: An introduction. In F. M. Moghaddam, R. Harré & N. Lee (Eds.), *Global conflict resolution through positioning analysis* (pp. 3-20). NY: Springer.

Monaco, J. (2000). *How to read a film: The art, technology, language, history and theory of film and media* (Revised ed.). NY: Oxford University Press.

Nelson, M. E. (2006). Mode, meaning and synaesthesia in multimedia l 2 writing. *Language Learning & Technology, 10*(2), 56-76.

Neperud, R. (1995). Transitions in art education: A search for meaning. In R. Neperud (Ed.), *Context, content, and community in art education: Beyond postmodernism*. NY: Teachers College Press.

New London Group, T. (2000). A pedagogy on multiliteracies: Designing social futures. In B. Cope & M. Kalantiz (Eds.), *Multiliteracies: Literacy learning and the design of social futures*. London: Routledge.

Nielsen, T. B. (2005, September). *Impressive narratives.* Paper presented at the Nordic Meeting for Children and Youth Films 2005 at Buster Film, Copenhagen.

Norman, D. (1998). *Affordances and design*. Retreived January 5, 2007. From http://www.jnd.org/dn.mss/affordances_and.html

Norman, D. (1999). *The design of everyday things*. London: MIT Press.

Norris, S. (2002). The implication of visual research for discourse analysis: Transcription beyond language. *Visual Communication, 1*(1), 97–121.

Norris, S. (2004a). *Analyzing multimodal interaction: A methodological framework*. NY and London: Routledge.

Norris, S. (2004b). *Multimodal interaction.* Retreived April 2, 2007 from http://www.sigridnorris.com/multimodal.html.

Nyboe, L., & Drotner, K. (2008). Identity, aesthetics and digital narration. In K. Lundby (Ed.), *Digital storytelling, mediatized stories – Self-representation in new media.* New York: Peter Lang, 161-176.

Öhman-Gullberg, L. (2006, September). *Visual popular culture as a signifying practise: A multimodal approach*. Presented at the DREAM Conference: Informal Learning and Digital Media: Constructions, Contexts, Consequences, Odense, Denmark.

Öhman-Gullberg, L. (2008). *Laddade Bilder. Representation och meningsskapande I unga tjejers filmberättande [Ambiguous Images. Representation and meaning in young girls' filmmaking].* PhD thesis, Stockholms Universitet.

Oudshoorn, N., Rommes, E., & Stienstra, M. (2004). Configuring the user as everybody: Gender and design cultures in information and communication technologies. *Science, Technology & Human Values, 29*(1), 30-63.

Ovid. (2000/ original 8). *Metamorphoses: Book 1* (A. S. Kline, Trans.). Retreived August 25, 2007 from http://etext.virginia.edu/latin/ovid/trans/Metamorph.htm

Panofsky, E. (1970). *Meaning in the visual arts*. Harmondsworth: Penguin.

Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*: New York: Basic Books.

Paulus, P. B., & Nijstad, B. A. (2003). *Group creativity: Innovation through collaboration.* New York: Oxford University Press.

Pedró, F. (2006). *The new millennium learners: Challenging our views on ict and learning*. Paris: OECD-CERI.

Peirce, C. S. (1894). *What is a sign? The value of knowledge: A miniature library of philosophy.* Retreived August 30, 2007 from http://www.marxists.org/reference/subject/philosophy/works/us/peirce1.htm#7

Philipsen, H. (2005). *The new wave of Danish film – Influences and imprints from the National Film School of Denmark.* University of Southern Denmark, Odense.

Prior, P. (2005). Moving multimodality beyond the binaries: A response to Gunther Kress' "Gains and losses." *Computers and Composition, 22*(1), 23-30.

Raney, K., & Hollands, H. (2000). Art education and talk: From modernist silence to postmodern chatter. In J. Sefton-Green & R. Sinker (Eds.), *Evaluating creativity: Making and learning by young people* (pp. 17-42). London: Routledge.

Rattleff, P. (2006). What is this thing called reflection? How we think and what we think about? A generic framework. Copenhagen: Danmarks Pædagogiske Universitetsforlag. In B. Sørensen, M. Buhl, & B. Meyer (Eds.), *Media and ICT: Learning potentials* (pp. 171-189).

Riley, H. (2006, May). *Towards a multimodal model for the teaching and production of narrative film.* Paper presented at the Third International Conference on Multimodality. Pavia, Italy.

Riley, S. (1999). *Contemporary art therapy with adolescents*: Jessica Kingsley Publishers.

Robertson, J., Gjedde, L., Aylett, R., Luckin, R., & Brna, P. (2008). *Inside stories: A narrative journey*. Edinburgh: Lulu.com.

Rommes, E. (2000). Gendered user-representations. In E. Balka & R. Smith (Eds.), *Women, work and computerization, charting a course to the future* (pp. 137-145). Vancouver: Kluwer Academic Publishers.

Rommes, E., Slooten, I. v., Oost, E. v., & Oudshoorn, N. (2004). *Designing inclusion: The development of ict products to include women in the information society*. SIGIS, Report for EU Information Society Technologies Programme (IST).

Rose, G. (2001). *Visual methodologies: An introduction to the interpretation of visual materials*. London: Sage Publications.

Sandbothe, M. (2005). *Pragmatic media philosophy. Foundations of a new discipline in the internet age* (A. Inkpin, Trans.). Retreived January 5, 2007. From http://www.sandbothe.net/381.html

Schön, D. (1987a). *Educating the reflective practitioner*. London: Jossey Bass.

Schön, D. (1987b). *Educating the reflective practitioner*. Talk at the annual conference of the American Educational Research Association. Washington, D.C. Retreived January 5, 2009. http://educ.queensu.ca/~russellt/howteach/schon87.htm

Schrøder, K., Drotner, K., Kline, S., & Murray, C. (2003). *Researching audiences*. London: Arnold.

Scollon, R. (2001a). Action and text: Toward an integrated understanding of the place of text in social (inter)action. In R. Wodak & M. Meyer (Eds.), *Methods in critical discourse analysis* (pp. 139–183). London: Sage.

Scollon, R. (2001b). *Mediated discourse: The nexus of practice.* London/New York: Routledge.

Scollon, R. (2006, May). *Mediated discourse analysis and nexus analysis*. PhD course, Centre for Discourse Studies at Aalborg University, Denmark.

Scollon, R., & Scollon, S. W. (2003). *Discourses in place: Language in the material world*. London: Routledge.

Scollon, R., & Scollon, S. W. (2004). *Nexus analysis: Discourse and the emerging internet*. London: Routledge.

Sefton-Green, J. (2000). Introduction: Evaluating creativity. In J. Sefton-Green & R. Sinker (Eds.), *Evaluating creativity: Making and learning by young people* (pp. 1-15). London: Routledge.

Sefton-Green, J. (2004). *Literature review in informal learning with technology outside school*. Bristol: NESTA Futurelab.

Sefton-Green, J. (2005). Timelines, timeframes and special effects: Software and creative media production. *Education, Communication & Information, 5*(1), 99-110.

Sellen, A. J., & Harper, R. H. R. (2002). *The myth of the paperless office*. Cambridge: MIT Press.

Shaffer, D. W., & Clinton, K. A. (2006). Tools for thoughts: Reexamining thinking in the digital age. *Mind, Culture, and Activity, 13*(4), 283-300.

Shusterman, R. (1988). *T.S. Eliot and the philosophy of criticism*. London: Gerald Duckworth.

Shusterman, R. (1999). The end of aesthetic experience. *Journal of Aesthetics and Art Criticism, 55*, 29-41.

Shusterman, R. (2000). *Pragmatist aesthetics: Living beauty, rethinking art* (second ed.). Lanham, MD: Rowman & Littlefield.

Shusterman, R. (2006a). Aesthetic experience: From analysis to eros. *The Journal of Aesthetics and Art Criticism, 64*(2: Spring).

Shusterman, R. (2006b, April). Talk on aesthetics in education at PhD course*Research in aesthetic experiences and their potential for learning*. The Danish University of Education, Copenhagen.

Shusterman, R. (2006c). *Thinking through the body/educating for the humanities – A plea for somaesthetics*. Open seminar, Danish University of Education, Copenhagen.

Sinker, R. (2000). Making multimedia: Evaluating young people's creative multimedia production. In J. Sefton-Green & R. Sinker (Eds.), *Evaluating creativity: Making and learning by young people* (pp. 187-215). London: Routledge.

Smith-Shank, D. L. (1995). Semiotic pedagogy and art education, *UIC Spiral Art education*: Art Education Program. Chicago: University of Illinois at Chicago.

Sørensen, B. H. (1999). Når børn producerer multimedier [When children produce multimedia]. In C. L. Christensen (Ed.), *Børn, Unge og Medier – Nordiske forskningsperspektiver [Children, Youth and Media-Nordic research perspectives]*. Göteborgs Universitet: Nordicom.

Sørensen, B. H., & Almqvist, S. (Eds.) 2001: *Multimediedidaktik og læring – Børn og unges multimedieproduktion [Multimedia pedagogy and learning- Children and young people's multimedia production]*.. Copenhagen: Gads Forlag.

Sørensen, B. H., Buhl, M., & Meyer, B. (Eds.). (2006). *Media and ICT: Learning potentials.* Copenhagen: Danmarks Pædagogiske Universitets Forlag.

Stafford, B. M. (1998). *Good looking: Essays on the virtue of images*. Cambridge: MIT Press.

Stankiewicz, M. A. (2004). Notions of technology and visual literacy. *Studies in Art Education, 46*(1), 88-91.

Stop Motion Pro. (2007). Retreived August 5, 2007. From http://www.stopmotionpro.com

Teglbjærg, H. S. (2009). *Kunstterapi i psykiatrisk behandling med særlig fokus på skizofreni [Art therapy in psychiatric treatment with focus on schizophrenia].* PhD thesis, Det Sundhedsvidenskabelige Fakultet, University of Århus, Denmark.

Toft, J. (2006). Billedanalyse [Visual analysis]. In G. Rose & H.-C. Christiansen (Eds.), *Analyse af billedmedier – En introduktion [Analysis of visual media-An introduction]* (pp. 77-102). Frederiksberg: Samfundslitteratur.

Tufte, B. (1998). *Tv på tavlen – Om børn, skole og medier [TV on the blackboard-On children, school and media]*. Copenhagen: Akademisk Forlag.

Tufte, B., & Christensen, O. (2002). *Børns mediebrug i familien – Og i skolen? [Children's media use in the family-And in, school?]*. (Report for the Danish Ministry of Education) Undervisningsministeriet.

Turkle, S. (1988). Computational reticence: Why women fear the intimate machine. In C. Kramarae (Ed.), *Technology and Women's Voices*. New York: Routledge & Kegan Paul.

UNI-C. (2005). *Tal der taler: Uddannelsesnøgletal 2005 [Numbers that speak: Key figures on education 2005]* Copenhagen: The Danish Ministry of Education.

Unknown. (450 BC). *Apollo & Daphene or Marpessa.* London: British Museum.

van House, N. (2006, April). *Interview viz: Visualization-assisted photo elicitation*. Paper presented at the CHI, Montréal, Québec, Canada.

van House, N. (2007). *Project overview of the social uses of personal photography*. Retrieved May 1, 2007 from http://www.ischool.berkeley.edu/~vanhouse/photo_project/index.php

van Leeuwen, T. (1985). Rhythmic structure of the film text. In T. A. van Dijk (Ed.), *Discourse and communication: New approaches to the analysis of mass media discourse and communication* (pp. 216-232). Berlin.

van Leeuwen, T. (1996). Moving English: The visual language of film. In S. Goodman & D. Graddol (Eds.), *Redesigning English: New texts, new identities* (pp. 81-105). London: Routledge and The Open University.

van Leeuwen, T. (2001). Semiotics and iconography. In T. van Leeuwen & C. Jewitt (Eds.), *Handbook of visual analysis* (pp. 92-118). London: Sage.

van Leeuwen, T. (2005). *Introducing social semiotics*. London: Routledge.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1986). *Thought and language* (revised ed.) Cambridge: The MIT Press.

Wad, S., & Vesth, L. (2001, October). *Filmlejrskole undervisningsmaterialer: Arbejdsgrupper, arbejdsopgaver og arbejdsområder for grupperne [Film camp teaching materials: Work groups, work tasks and work areas]*. Retreived August 5, 2007. From http://www.station-next.dk/uvmaterialer/filmlejr/tiendea/arbgrp.html

Wegerif, R. (2007). *Dialogic, educational and technology: Expanding the space of learning*. New York: Springer-Verlag.

Wegerif, R. (2008). Dialogic or dialectic? The significance of ontological assumptions in research on educational dialogue. *Educational Research Journal, 34*(3) 347-361.

Wertsch, J. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.

Wertsch, J. (1998). *Mind as action*. NY: Oxford University.

Wertsch, J. (2002, November). *Culture, communication and cognition.* Paper presented at the Pandora's Toolbox conference: How digital tools empower learners and teachers, National Museum of Photography, Film and Television, Bradford, UK.

Williams, D. (1985). *Greek vases*. London: British Museum Press.

Willis, P. (1990). *Common culture*. Buckingham: Open University Press.

Willis, P. (2000). *The ethnographic imagination*. Oxford: Blackwell.

Winnicott, D. (1971). *Playing and reality*. London: Tavistock/Routledge.

Contents of the Full Appendix for the Committee

Folder 1 Film texts (Chapter 9) contains the five short animated films made by the students

- Metamorphosis (Metamorfose)
- The Out-breakers (Udbryderne)
- Equal Horses Play Best (Lige hest leger bedst)
- The Onion Man Returns III: Getting there is very important (Løgmanden vender tilbage III: Getting there is very important)
- The Spot Is Mine (Pletten er min)
- Film synopses by the students

Folder 2 Filmmaking (Chapter 8) contains six subfolders with materials about the filmmaking week.

- Microanalysis_windows 1, 2, 3 contains three edited video data clips (22 minutes total), three documents with transcripts, and my analytic questions.
- ClassroomVideo_transcripts contains English and Danish transcripts, preliminary and a journalistic report of two film groups in the phases of filmmaking, with a focus on the *Out-breakers* and *Metamorphosis* film groups. The subfolder ClassroomTeachMaterial contains the information given to students during the filmmaking course.
- Questionnaires—standard form given to the students.
- Equipment_planning documents, process of gathering animation equipment, etc.
- Observers' information given to my observers.
- Storyboards_all films contains all storyboards by film groups.

Folder 3 Filmmakers (Chapter 7) contains data for each of the eight individual portraits is in a subfolder with a student name. Each subfolder contains the following:

- My analysis of photos using charts
- Summary of interview in English
- Interview with the student transcribed in Danish
- All photos taken by the student and a sample of their cultural probe diary
- The standard interview guide

Folder: The Animation Island (AnimationsØen) Web site contains:

- A video demo captured from www.dr.dk with voice demo by me as an introduction to the contents on the site (8 minutes long)
- Report about design and development of Web site
- Contents of Web site as PDFs: texts, Web pages

Folder: Permission_project planning shows permission forms