Chapter 15

Digital Anatomies: Analysis as Production in Media Education

Andrew Burn
University of London

James Durran
Parkside Community College

We want to talk, in this chapter, about some of our work that relates to the use of new technologies within media education and how it relates to the understanding, interpretation, and analysis of media texts. Our examples and interviews come from the first specialist Media Arts college in the UK, Parkside Community College in Cambridge, a small comprehensive school in which one of us worked formerly and one of us is still working. This school has been working with digital video since 1997, and we have published a number of accounts of work in this field (Burn, 2000; Burn & Durran, 1998; Burn & Reed, 1999; Burn et al., 2001).

For us, the phrase *digital generations* suggests that the difference of digital is an absolute distinction—it implies a rupture between the technologies and cultures of the digital and analogue ages, a generation gap between the groups of people caught up in these ages, a linear past and a nonlinear future, a former swamp of dinosaur technologies, and a future utopia of dazzling digital manipulations (and a present caught uncomfortably between the two).

Needless to say, we want to resist and question these rhetorics of rupture. Our main focus in this chapter is on digital video in school-based media education, and it challenges the generational rhetoric of rupture in a specific way. Digital Video editing software, although it has been bundled with i-macs for some time now and with Windows XP for 3 years, is not as much used by teenagers as the cyberkid rhetoric would suggest. Although there are clearly some digital technologies that young people make their own—

LEA—THE TYPE HOUSE—DIGITAL GENERATIONS (BUCKINGHAM AND WILLETT)

Instant Messaging (IM) and chat, computer games, and SMS being obvious examples—there are others that they do not use so readily, so intuitively, or so automatically—Web-authoring software, graphics software, animation software like Macromedia's Flash, and Digital Video Editing software. To return to the generational theme, we might compare this with the domestic use of cameras over the 20th century. Although most households owned cameras, took holiday and family snapshots, and made photo albums, very few people made and used their own darkrooms, although the technology was not particularly hard to come by and use for an ambitious amateur. In the same way, the domestic ownership and use of camcorders is now widespread and in many ways is an obvious successor to the still camera. But just as the extra step into the darkroom, a space between the domestic and professional realms, was a step too far for most people, it may be that the same thing is happening with digital video editing. Access is not the problem—but the motivation to take point'n'press a step further toward production seems to be limited to an enthusiastic minority at one level, with their own culture of specialist magazines and web sites, and the world of semiprofessional independent film making a step further beyond that. We want to argue that the interstitial space between domestic camcorder use and professional video and film work is exactly the space education is best suited to occupy.

The problem here for education is how to respond to the use of media technologies in the domestic sphere. If children (or anyone else for that matter) can perfectly well learn to use such technologies informally, then education has nothing to add. If they can learn to use them functionally, but do not necessarily acquire a critical understanding of them, then education can offer to develop this. Alternatively, if only some people learn to use them informally, others only partially or not at all, then education has a clear role to level the playing field. Williams (1989) considered this problem in a prophetic essay about the future of communication technologies, arguing:

> The most basic social skills, of a kind acquired in quite primary development and relationship, gave access to the motion picture, the radio broadcast, the television program, at the level of reception, while very easily learned skills gave more general access, including some production, to the photograph and telephone. Thus the new technologies were inherently more general, and less apparently subject to systems of training. . . . It was not only that the institutions of the new technologies, in the very course of their development, and especially of autonomous production, became, in themselves, training systems. In immediate ways, types of speech, points of view, catch phrases, jingles, rhythms were in effect taught. . . . (pp. 189–190)

The question now, then, is whether Williams' notion of *training systems* provided by the technologies—in effect, that they teach the skills needed to

use them—will render formal training and education systems redundant for this purpose. Our argument is that Williams missed the crucial interstitial space between the domestic and the professional. This is the space where the realm of the amateur minority, who have self-trained in more advanced skills, overlaps with the educational realm where similar skills are provided for the many who would not otherwise acquire them. To take Williams' example of photography, there was an obvious case for education to make photography for all an important mode of expressive work in schools through the 20th century, in step with the importance of this medium in global culture more generally. Equally obviously, the curriculum of the West, dominated by the imperatives of print literacy in particular, failed to respond to this challenge. It may be that we now face a similar opportunity—the chance to widen the expressive and communicative repertoires of our students to include the variety of moving image practices and cultures so important in their lives and ours; but also the danger that this kind of work will be relegated to a few specialist courses or an enthusiastic minority while the center of gravity of the curriculum performs a wholesale retreat into narrow models of print literacy more characteristic of the early and mid-20th century. Against this pull, advocates of media education argue that everyone should have the chance to enter the space between the domestic and professional spheres to taste a little of what it is like to make something in the audiovisual media. This experience gives them a more explicit understanding of media technologies, the grammars they use, and the contexts in which they are deployed. We hope this makes a difference to their understanding and perception of their world and how it is represented.

To narrow the focus a little, we want to concentrate on the relation between the new possibilities for production and the analytical and interpretive work of media education. Obviously, no one wants these to pull apart, but pull apart they do. At one level, there is the difficulty of the production sandwich: the bacon of practical video making encased by the stodgy bread of analysis; abstract decoding before the production work and abstract written work afterward. The more the two pull apart, the more they become stereotyped and caricatured; analysis becomes dry, arid, abstract, paperbound, alienating, joyless, and inauthentic; production becomes creative, expressive, concrete, digital, pleasurable, and authentic.

This rather begs the question of what the analysis is for: Why might we want children to analyze the media? We do not have space to address this question in any detail, but we briefly say that, as is commonly the position in media education these days, we do not see children as dupes of the media, but as active readers, spectators, players, and makers who appropriate media images, themes, sounds, and words for their own purposes, the building and testing out of their identities, the imagining of their futures, and the construction of their cultures and tastes. However, we also believe that me-

dia education can extend both their critical understanding of the media and their technical and creative ability to make their own media texts, and that these two are intimately related, even inseparable, the recto and verso of the media education page. This is by no means a new argument. Indeed, it is a central thesis of the collection of essays by Buckingham, Grahame, and Sefton-Green (1995) in *Making Media*, and we acknowledge the pioneering essay by Sefton-Green in that collection, one of the earliest explorations of the use of digital video in the classroom.

We also follow Buckingham (2003) in considering the conceptual learning involved in media production from a viewpoint provided by Vygotsky's (1986) model of conceptual development through social interaction. As Buckingham pointed out, although Vygotsky's argument that *spontaneous concepts* emerge from social interactions is certainly opposite to a social account of media cultures, his notion of the *scientific concepts* developed by formal education is oddly asocial. We explore examples of the kinds of scientific concept promoted by media education and how they might be socially located.

What we hope to contribute here is a more detailed examination of how children learn about specific aspects of the language of the moving image through the use of digital production technologies for analysis; how this draws on their existing knowledge of film; and how it is, at the same time, a creative enterprise. But we also want to challenge the stereotypes we referred to a little earlier. On the one hand, we want to challenge the idea of analysis as sterile, arid, paper-bound, inauthentic, and uncreative. On the other hand, we want to challenge the idea that production is always for its own sake justified as a creative enterprise only and purely expressive in function. We want to suggest, rather, that the technologies of production can be tools of *anatomy*, which children can use to undo the fabric of media texts, pulling them apart to see what structures hold them together. At the same time, we want to suggest that this process is not just an exercise, just a *deconstruction*, to misuse that word for a moment. We may have this purpose in mind, but for the children in our classes, this kind of anatomical work also involves re-assembly, re-presentation, and a kind of creativity that is about ideas as well as the pleasurable manipulation of the material medium.

We describe two units of work followed by students at Parkside. In part, each addresses an aspect of film language at the microlevel—the grammar of how shots are sequenced to make meanings. In effect, this is the language of the continuity system in film (see e.g., Bordwell & Thompson, 2001). There is a debate about how adequate this system is to describe the moving image as a signifying system, and elsewhere we have proposed an alternative system based on a view of the moving image as an assemblage of different communicative modes, which we have termed the *kineikonic* mode

(Burn & Parker, 2003). Such a system accounts for the meaning students are reaching for at certain moments more exactly than the traditional grammar of film.

EDITING *ROMEO AND JULIET*

At Parkside, Year 8 students (ages 12–13) work on Baz Luhrmann's *Romeo and Juliet*. Having watched the film and discussed in general terms Luhrmann's style and approach, students look closely at one short sequence:

Tybalt: Turn and draw!
Romeo: I do protest, I never injured thee
But love thee better than thou can'st devise.

These three lines occupy 13 seconds of film and 12 discrete camera shots. Students have seen the sequence in context when watching the film, but now have to try to visualize it just from the soundtrack, played several times. They are then given the camera shots as still images on small laminated cards and attempt to put them in sequence. This is, in a sense, already a production activity—the students are experimenting with making meanings with images, but it is production for the purpose of anatomizing the sequence.

The activity is familiar to children through text sequencing tasks in English lessons. It is social and active, and it requires complex speaking and listening as ideas are negotiated and revised. It is much harder than might be expected, and it is therefore productive to intervene after a few minutes, asking the class what methods and principles they are using to sequence the shots. In this discussion, students start to list these principles or conventions on the board.

This exploration and puzzle solving is followed by a more formal, instructional part of the lesson, in which the students decide as a class on a technical description of each shot and its function in the sequence. The conventions listed include: reverse angle shots; clues in the eye lines of characters; continuity of action; point-of-view shots, juxtaposed with shots that identify the character looking; the avoidance of jump cuts; and reaction shots. This is not arduous, however: The active reconstruction of the sequence and the associated discussion of its grammar make this analytic thinking straightforward (Fig. 15.1).

This sequence of activities involves movement between informal understandings and categorizations of aspects of the moving image and more formal ones. This movement exemplifies Vygotsky's (1986) distinction between spontaneous and scientific concepts. At the same time, the conceptual learning here depends heavily on the use of what Vygotsky (1978)

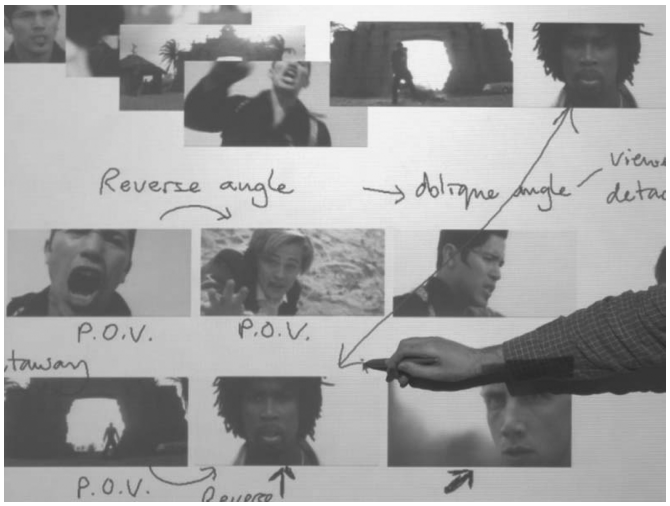

FIG. 15.1. Modeling film language on an interactive whiteboard.

called semiotic *tools* and *artefacts*. Wells (1994) developed the distinction between these two categories: artefacts are the concepts offered to learners in the form of language, and tools are the semiotic processes through which the learners manipulate the concepts. In this course, there is a complex sequence in which concepts provided by the teacher as artefacts in both speech and writing are transformed by students using a range of tools, which include different kinds of writing, different kinds of talk, and the use of digital video editing software.

This is an iterative process in which the concepts are offered to the students for their *conscious* manipulation, which is one of Vygotsky's criteria for scientific concepts. The rehearsal of the concepts begins with speech, emerging from the work with laminated screen shots; it then moves to writing in the discussion and whiteboard activity. Finally, although language is most frequently seen as the prime tool for concept naming, in this case, the written label is co-present with the exemplifying image, and with the spoken word in the discussion between students, and between student and teacher. Although the word (e.g., *reverse shot*) indisputably possesses generality and systematicity (two more of Vygotsky's criteria for scientific concepts), the multimodal link with the visual image provides a concrete specificity that both remediates the abstractness of the word and makes a connection with the social meanings from which the concept derives, and with the practical anatomical process of ordering the screenshots.

In the next stage, students are then given a chance to rehearse these understandings further in an editing activity, using Adobe *Premiere* editing software. They are provided with the individual shots from a longer se-

quence in the film, of about 1 minute, when Romeo is being pursued across Verona as he tries to reach the dead Juliet. These have been arrayed in the bin and are ready to insert on the timeline. However, students are not asked simply to reconstruct Luhrmann's original film: As well as the individual camera shots from this sequence, they have at their disposal a number of shots from other parts of the film, which they can use as flashbacks. In addition to the original soundtrack for the sequence, they have romantic music from the lovers' first meeting and tragic music from the finale in the tomb. They are therefore able to make a wide range of new versions of the sequence, creating different moods, and making references to other parts of the narrative (Fig. 15.2).

As well as using their understanding of moving image grammar to establish continuity and to make the narrative coherent, they start to make new meanings. In fact these might move beyond the strict conventions of the continuity system and use forms of juxtaposition between shots and between image and music more characteristic of the montage elaborated in particular by Eisenstein (1968). This sort of juxtaposition can also be understood in terms of multimodality theory (Kress & van Leeuwen, 2000): The kineikonic mode combines a range of different signifying systems, the important ones here being music, visual dramatic sequences, and the affordances of editing—shot structure, transitions, duration, pace, and rhythm.

FIG. 15.2. Adobe Premier editing interface showing student re-edit of *Romeo & Juliet.*

Interviewing students, it is clear that they appreciate the learning that comes from this activity—from the anatomizing of film that it allows. To Guthrie, the activity was like the "opening of a portal." It was about learning.

> . . . the use of being able to cut from shot to shot, instead of being, like, in a theatre and watching the whole thing on one screen constantly . . . how you can create emotions using particular techniques.

The comparison with theater here indicates a particular conceptual leap in moving image literacy that recognizes the disjunctive nature of film. Lottie identified the importance—as a learner—of being able to design, rather than just analyze, a sequence:

> When you did it yourself, you could see so many things that you could do with it, that you wouldn't have thought of doing . . . if you'd seen a picture of a clock, you wouldn't have put it maybe with, like, the police car, but when you can see it, and you can dissolve it into each other . . . and you can see it and how it changes it, how it makes it more interesting or do different things. . . .

This kind of design is not so much about continuity editing, which emphasizes narrative sequence; it is much more reminiscent of the montage principle of Eisenstein—it suggests the principle of the third meaning produced by montage from the juxtaposition of quite disparate shots, and by coincidence recalls Eisenstein's (1968) account of a montage of clocks in his film *October*.

To Richard, the concrete experience of manipulating film footage makes it stick mentally:

> . . . you remember more practical work, rather than just sitting there with a piece of paper, saying why they did this and why they did that.

Very apparent in these students' spoken comments is the pleasure of this sort of anatomizing of text. But the pleasure is also in being creative—of becoming a producer rather than just a reader of text; or perhaps a kind of textual infiltrator, which is suggested by Richard's metaphor of injection:

> I found it quite fun because it was like making your own movie . . . inject ourselves into the film.

Writing about the activity, Charlotte ended:

> What I like most though is that I'm the producer of my own film and I can have whichever clips I want!

Several students commented on how the editing activity affected their general perceptions and awareness of film.

Guthrie: . . . [it's about] not taking for granted our media surroundings . . . seeing their complexities and how they're structured . . .

Ben: I now often walk down the street and find myself imagining my own film sequence . . .

Lottie: I don't think I shall be able to go to the cinema, or watch another movie, without thinking about all the different shots and sounds in a small scene again . . . I found the idea that you could make a shot with the camera much longer or shorter, or faster or slower . . . fascinating and clever. I thought the shot was however long you filmed it with the camera for.

This is a good example of how students can learn key principles of the grammar of editing by doing—the revelation that editing reworks the filmed material, and that speed is also a variable of edited pieces.

This *Romeo and Juliet* course models a distinctive process of teaching and learning in media, illustrating the dialogic and dynamic learning described by Buckingham (2003) in *Media Education*. In the sequencing activity, students are working in small groups to discover meanings and structures in text, making sense out of their implicit understandings. Teacher intervention and instruction are folded into this process, introducing some formal grammatical concepts and scaffolding the articulation of new understandings (Bruner, 1983). As students use the editing software to redesign part of the film, they rehearse and consolidate the scientific concepts they have learned. Having acquired these initially as semiotic *artefacts*, they develop their use of them through the semiotic *tools* provided by the editing software, in which the abstract concept becomes process and the fixity of the written label becomes the fluidity of working practice.

The digital medium makes possible a specific kind of learning. Any moment in the process is always provisional, as the display of the edit in the interface, like all digital compositions, is governed by what Manovich (2001) called the principle of *variability*—media objects in a database held in a temporary configuration by algorithmic instructions. This principle produces iterative design, in which ideas are tried out, rejected, revised, continually varied, and reshaped. There are, then, two parallel processes. In one, the digital medium is revised in an iterative process; in the other, the concepts in play are further rehearsed and consolidated. In both, specific elements—say the concept of a closeup and a corresponding image—are re-

lated to the conceptual system of editing and the practical instance of the edited sequence on the timeline.

However, the students are also pursuing creative and social pleasures as producers of new, unique texts. These pleasures express specific social interests, and these are related to the social context from which the concepts are appropriated. The students' writing suggests the pleasure of self-representation ("inject ourselves into the film"), of the cultural work of the film maker ("I'm the producer of my own film"), and of different sites of spectatorship ("I don't think I shall be able to go to the cinema . . . without imagining"). Curiously, the one social site they do not suggest is the classroom, which perhaps implies the success of the course in connecting this work to the cultural contexts in which the students experience film. These contexts support the argument of Wells (1994) that Vygotsky's framework must be extended to account for the social context of scientific concepts as well as spontaneous concepts.

In their written work, students consolidate the understandings they have gained. Danielle explains the grammar of a part of the first sequence:

> The camera tilts upwards on Tybalt, this is because the last shot was Romeo and he is on the floor and the camera was going upwards from the floor focusing on Tybalt's reaction of what Romeo has just said. This tells the audience that Tybalt is the one in control and gives you the sense of power.

She has picked up some formal terms in which to describe camera shots (*tilts*, *reaction*), but these scientific concepts are still mixed with spontaneous terms (*the camera was going upward*). Similarly, when discussing how meaning is made, she switches between a formal media term (*tells the audience*) and the more colloquial *gives you the sense*.

Meanwhile, Siyao describes the grammar of the sequence in a confidently precise way, using technical terms with ease:

> The first frame of the sequence is a close-up from front of Tybalt's angry and aggressive face, which is very frightening and involving. The next frame is a cut to reverse angle, over the shoulder medium shot, which allows the audience to share Mercutio's view of what is happening and also, this rapid cutting to Mercutio's point of view adds to the sense of danger.

This not only uses the terminology of the continuity system, but also recognizes both the multimodal nature of film in its description of the dramatic work of the actor (although this is described rather than fully conceptualized) and the system of address at work in the film's positioning of the audience. This level of response is evidence of the potential of this kind of work, with moving images to accelerate students' analytic thinking and writing, prompting sophisticated, precise, and imaginative articulations of the rela-

tionships among form, meaning, and effect. Perhaps this has to do with the nature of the visual medium. Students are abstracting from visual, rather than verbal, constructs. The technical terms can be linked to mental pictures or combinations of pictures. This is not to suggest that articulating ideas about images is easier than doing so about verbal texts or less subtle, but that it motivates and prompts precise argument and careful distinction. This is true for students of all abilities, including those who might be termed *gifted and talented*. Joe, for example, perceives and explains considerable subtlety in editing decisions:

> Also, at that point when the camera tracks up, it is the first time there has been any significant movement in it. the camera has stayed still to reflect the movement of the most important character in the sequence: like Mercutio, the camera has witnessed everything, but has done nothing about it . . .

> The final shot is of a new character to the sequence: Samson. The camera is placed at an oblique angle to him. He is not an important character, he is at the side of the action. His emotion, his expression of fear and anxiety, needs to be acknowledged—not felt—by the audience. He simply watches—he does not act.

What seems to be happening here is that the analysis is exceeding the conventional descriptive apparatus of the continuity system and exploring more experimental ideas. The equation of an oblique camera angle to a meaning of social detachment is an example: Similar meanings of oblique angles are proposed as an aspect of visual grammar by Kress and van Leeuwen (1996).

Already it is becoming clear, then, that whatever concepts the students inherit at the beginning of the course are by no means a fixed and undisputed set of ideas any more than the notion of a *scientific concept* is a homogeneous category. Rather, such concepts are relative (e.g., exhibiting degrees of abstractness), disputed, and subject to forms of transformation and extension by both teacher and student.

PRESENTING *PSYCHO*

In Year 9, at Parkside 13- to 14-year-old students study Hitchcock's *Psycho* as part of an exploration of the horror genre. Our choice of *Psycho* may seem a little conservative, and it is indeed our intention to introduce students to their cinematic heritage—to the work of a valued auteur. However, they also watch and discuss numerous clips from contemporary horror and explore the way *Psycho* has influenced them. They often bring to lessons com-

ments from older relatives who remember the original release of the film, and so they are encouraged to reflect on modern popular culture as part of a historical movement among generations. Although *Psycho* is easy to study objectively because of its historical distance, this does not seem to alienate the students, who still find it gripping and worthy of repeated viewing.

At the start of the course, students discuss issues surrounding the horror genre and explore their own relationship with it. They consider the difference between subgenres—notably *gothic* and *slasher*, which are particularly pertinent to *Psycho*. They explore the relationship between pleasure and fear, reflect on the culture of what Buckingham (1996) called *distress and delight*, and analyze how directors seek to frighten their audiences in numerous clips. In doing so, they begin to catalogue techniques, and they continue to extend their language for describing film. They are reminded that film has its own grammar, and they look for how this works in pairs of shots from *Psycho*, working out why—when placed in sequence—they promote fear or anxiety in an audience.

Although the students do produce some writing, the main assessed outcome of the course is oral. Pairs or small groups of students choose short sequences from the film and present analyses of them to the rest of the class using *PowerPoint*. The following is an extract from an oral presentation by two students, working through the sequence in which the detective Arbogast is murdered on the staircase.

Farhana: Right, here . . . if you comp . . . If you compare, sorry, compare the scene to the *Gift* scene, you can see that the door opens and the music gradually gets higher and higher until it just blares out and the woman, well, Bates comes from here and attacks him, just as the woman in the bathroom, the music blares out and she turns round.

Richard: Erm . . . the high strings, I think, adds more tension, just as the woman's just about to come out of the door.

Farhana: OK, mise-en-scene very typical—horrible, old kind of doors, and old rugs—gothic rugs . . .

Richard: The door is now fully open, and it makes you really want to know what's behind the door, but you can't tell.
They play a short clip, within the PowerPoint *presentation. Class laughter. Clip ends. More laughter.*

Farhana: Ok, erm, we kind of felt that he's just about to reach the top of the stairs, he's just about to step away from danger, but as he takes that step . . . something appears.

Richard: Erm, the bird's eye view shot is very good, Hitchcock has used it amazingly well, because you can see Arbogast just getting to

the top of the stairs, and you can also see the attacker coming out of the door.

Farhana: We've highlighted this area because we don't know what it is. It could be something, could it be the attacker, or is it some . . . freaky . . . towel-like thing *(Laughter)* . . .

By the reference to *The Gift* (Sam Raimi, 2000), the students are relating their understanding of *Psycho* to their knowledge of popular contemporary texts. Here the comparison is within an academic discourse that the students have learned, exemplified by formal terms like *mise-en-scene* and *gothic*. However, the counterpointing informality and jokiness of the delivery, and the laughter of the class at seeing—yet again—the famous clip of the detective being stabbed, reflect social pleasures of performance, repetition, and rehearsal. This choosing and presenting of sequences by the students is like a formalization and harnessing in the classroom of a familiar teenage cultural event: the repeated watching, recounting, and anatomizing of frightening horror sequences, which recall Wood's (1993) study of how teenage boys repeatedly rewind enjoyable bits in horror videos. This begins to give some shape to the social nature of the movement from spontaneous to scientific concepts. Far from being a move into an abstract realm somehow positioned outside society, it is still firmly attached to the pleasures and discourse of popular viewing, although the possible readings, language, and identities implied by a quasi-academic discourse also have a presence in the room.

PowerPoint allows the students to quote from the film—just as they might quote from a novel—by incorporating still images and moving clips. To create these, they use *Windows Moviemaker*, on which they can view the whole of *Psycho*, chopped up into small chunks (Fig. 15.3).

This is a completely new way of viewing film. The hundreds of clips are arrayed in a frame, which the students can scan by scrolling up and down. They can play these clips individually or they can assemble them on the timeline to make longer sequences. They can easily wind backward and forward through shots and sequences, and they can easily assemble contrasting or similar shots. The students are encouraged to reflect on how this way of working with film differs from a video or DVD. Ada articulates very clearly how she is using production technology to anatomize a film text:

> Seeing the film in little clips makes it seem more like a work in progress than a finished film. You feel like you are in the editing studio choosing what clip goes where and analyzing what difference things will make. The advantages for this sort of work are that you can experiment many different ways with the clip of frame. You can change the order of sequences or flip the image to see

FIG. 15.3. Students working with Microsoft Moviemaker 2 to explore shot types in *Psycho*.

> how it would have been done differently. Also you can compare the two shots, looking at the contrast and similarities between them.

The verbs she uses map the complexity of this process: *choosing*, *analyzing*, *experiment*, *change*, *flip*, and *compare*. To her, the distinction between analysis and production is blurred: "You feel like you are in the editing studio. . . ." In terms of conceptual learning, the emphasis here is on the dynamic process, rather than on the abstract concept. The verbs in effect undo the concentrated abstraction of concepts like *edit*, *sequence*, *order*, and *inversion*, remaking them as social actions. It is true that such actions must accompany concept acquisition. Just as important, we suggest, they need to be continually returned to if the concepts are to remain dynamic.

Ada also pointed to the pleasure of this way of working—the feeling of "control" and ownership over the text:

> Viewing the film this way on Moviemaker, all cut up into sections, makes you feel in control as you can do whatever you like with the film. Whereas when you are watching a film you are the one who is weak, you can't change what you are watching.

Significantly, this has to do with both affect and agency. "You feel like you are in the editing room" and "you feel in control" indicate the affective load of such work, as we have noted before in relation to girls' digital editing work (Burn & Reed, 1999). The agency is not some kind of abstract power, but is imagined by Ada in a specific social context—the world of professional editing.

In the following extract, two girls, Hannah and Hannah, are using *Moviemaker* to choose a short clip to import to *PowerPoint* as a quotation. It gives a glimpse of how students use the two pieces of software in, as it were, dialogue—moving from one to the other on screen. They use *Moviemaker* to disassemble one text, and they use *PowerPoint* to design a different one. It shows the crucial affordance of the editing software to revise and experiment as the girls try out different lengths of clip to judge their effect.

Hannah 1: *(Viewing clip on timeline)* Ok, let's skip . . . we don't want . . . actually, shall we have, I don't know whether that's too long, is that too long, or this . . .

Hannah 2: How long does it go on for?

Hannah 1: How many seconds . . . *(Peers at timeline)* oh, it's only 22 seconds . . . can that be?

Hannah 2: *(Patiently)* Yes, that can be.

Hannah 1: Is that . . . is that too long . . . ?

Hannah 2: No.

Hannah 1: So if we have all of this . . . *(Scrolls backwards and forwards along timeline, to view length of clip.)* But I don't know how we join them, how we have all of this. . . . How do we have all of this?

Hannah 2: Well you just save it!

Hannah 1: Well shall we see what it's like when we get rid of the bit with the woman in?

Hannah 2: Yes.

Hannah 1: All right. *(Uses mouse to drag end of clip on timeline.)*

Hannah 2: The woman coming by gives more suspense and tension.

Hannah 1: Yeah, shall we leave her then?

Hannah 2: Yeah.

Hannah 1: Good thinking Hannah. I'm proud.

Hannah 2: Well, at least once you admit to my fantastic . . .

Hannah 1: No, I've told you all the day through . . .

Hannah 2: Yeah, yeah, yeah . . .

Hannah 1: What shall we save it as? We'll call ourselves "Hans" . . . *(Saves clip to disc)*
Right, let's go into PowerPoint. (*"Minimises"* Moviemaker; *"Maximises"* PowerPoint)
We want it on a new slide though.

Hannah 2: Yeah, put it on a new slide.

This dialogue also shows how, at the preparatory stage, the students are again engaged in a hybrid discourse, combining analytic talk with social chat, role-making, and humor. Again conceptual understandings of order, selection, and generic characteristics such as suspense and tension are worked through as action, exploiting the iterative nature of digital video editing, Manovich's (2001) principle of variability. As in all the activities in this project, at least two sets of semiotic tools are in play to mediate the concepts—in this case, the editing software and the accompanying speech. By contrast with Ada's writing, the conceptual understandings here are not rooted in an imaginary projection of the students' identities as future film directors, but in the language of pleasurable apprenticeship, secure in its search for technical competence, and wittily dismissive of pretension.

At times humor is explicitly satirical of the insistent search for signification that the students have been taught:

James:	It's set in a bedroom, which suggests security and . . . can't remember what it was.
Qiu Xiang:	Secrecy.
James:	Secrecy, right.
Qiu Xiang:	Cos, you don't usually get random people going into your bedroom.
James:	And, also, very strangely, she has a moustache . . .
Qiu Xiang:	(Laughs)
James:	. . . suggests something or other—we're not quite sure what . . .
Qiu Xiang:	She might be a transvestite herself . . . you never know . . .

Again, the abstraction of inferential readings of the film ("suggests security") is as accurate as any teacher might require, but located within a parodic play on such interpretive work.

A further extract from the same pair working gives a glimpse of how sophisticated this anatomizing on *Moviemaker* can be:

James:	. . . from the money to the suitcase, suggesting they're making a getaway.
Qiu Xiang:	Yes.
James:	And then . . .
Qiu Xiang:	Ok, and then that's, her—Marion's thoughts on the money, being shown by the camera inter-cutting between

close-ups, no, medium close-ups of Marion, and various shots of the money.

James: That's her agitation shown by quick, jerky movements, 'n taut expression, and always keeping one eye on the money . . .

In a largely recursive media curriculum, it is interesting to consider how the Year 9 course, in which there is more emphasis on the discovery and articulation of subtle meanings, might represent genuine progression from the Year 8 course. Qiu Xiang and James show a more secure understanding of the multimodality of moving images, analyzing the integration of camerawork, editing, acting, and sound, and a more fluent relation of editing decisions to narrative concerns. They are also engaging more confidently with scientific concepts and the terminology that represents them. At times they discuss this metalanguage explicitly:

Qiu Xiang: . . . the music is a very slow, but, tense. A mixture of high and low strings. I dunno what else to say about the music . . .

James: If you hear very closely you can hear a door in the background.

Qiu Xiang: . . . are they non-ju . . . oops, can't talk, are they diegetic or non-diegetic?

James: I think non-diegetics are sounds that only the viewer can hear. And diegetic is things that the people can hear, in the thing . . .

Qiu Xiang: Oh . . .

Interestingly, the way they talk here about the music demonstrates the problems of seeing absolute distinctions between spontaneous and scientific concepts, rather than treating them, as we want to do, more as ideational complexes, which may have greater or lesser degrees of abstraction and systematicity. Qiu Xiang's and James' terms for describing the sound are on a continuum between the everyday and technical concepts: *very slow but tense*, *high and low strings*, and *diegetic or nondiegetic*. Also, although *diegetic* is clearly *scientific*, a word like *slow* is less easy to categorize. Although clearly an everyday term, it also fulfills all of Vygotsky's criteria for scientific concepts here: It is general, systematic, consciously applied, and voluntarily controlled. However, the distinction between them may be better accounted for in terms of discursive genres: The former clearly belongs to the explicit and specific preoccupations of an academic community, whereas the latter does not.

Qiu Xiang's subsequent writing about this same sequence exemplifies the increased fluency and confidence of the Year 9 work. There is more sense of argument in the writing—of an effort to persuade. There is a more sophisticated sentence structure than in the Year 8 writing, reflecting more sophisticated interpretations, and evaluation is woven into explanation and analysis. Again there is a strong sense of the multimodal nature of film as the analysis of filming and editing structures is integrated with a recognition of the dramatic work of the actor, and she explicitly considers how these two signifying modes work together to create meaning:

> Throughout the sequence the camera would keep intercutting between Marion and the money, to emphasize that she is finding it really hard to refrain from stealing the money for her own use. There is also a fine balance of panning, tracking and cutting to set a pace that's just right for creating the right atmosphere: the sequence is tense but not too action packed for lots of cutting and not too relaxed for long pans and tracks.
>
> Marion's expression and body language remains more or less the same throughout the sequence, the same taut, troubled look she seems to sport throughout the film. To emphasize how hurried she was, the camera stops at a medium shot of her doing up her one-handed blouse while packing/roughly throwing her clothes into a large trunk. Every time the camera cuts from the money to her and vice versa, she would always stop and look at the money for a good while before carrying on with whatever she's doing. This shows how much she thinks about the money and her stopping to look at the money symbolises that if faced with the dilemma, she will be willing to do whatever it takes to get the money.

To some extent, this is a function of the students' general development over time. However, students do study a greater variety of sequences, and there is in the course a culture of student autonomy and expertise, in which students choose sequences to analyze independently. Of course *PowerPoint* and *Moviemaker* represent different and powerful ways to organize and develop analytic thinking through quasi-production practices.

It is tempting to see concept acquisition as a one-way trek from the fuzzy informality of the spontaneous concept (characteristically oral) to the precise fixity of the scientific concept (characteristically written). In fact this sequence of activities shows a complex shuttling between oral and written modes (including the writing of DV editing and PowerPoint), in which the concepts become temporarily fixed in print, diagram, and still and moving image. Interestingly, the sequence ends with an oral presentation, in which the concepts become fluid again in talk. These forms of provisional exemplification, transformation, and oscillation between modes and social registers seem to be good examples of how concepts are built and revised.

CONCLUSION

Our argument, then, is that the technologies of production can and should be used for the digital anatomy and analysis of the moving image. If a text is something woven, from the Latin "to weave," *texere*, then this is an argument for unweaving, deciphering, and reweaving differently. Renaissance pioneers of anatomy like Michelangelo and Leonardo sliced into human musculature for artistic purposes; science and art were harder to distinguish. In these media courses, again, we can strategically blur scientific and artistic purposes, processes, and outcomes. The semiotic tools operate in two ways—first, in the Vygotskyan sense, to manipulate conceptual understandings; and second, in the artistic sense, to create a new moving image text.

Like Buckingham, then, we argue that the scientific concept needs to be understood in its social contexts. The context of this learning in the two activities considered in this chapter is social in four important ways:

1. The rehearsal of the concepts and the refinement of the edit occur through joint manipulation of the software by pairs of students and through the talk that accompanies this work. Our argument here is that the classroom is an authentically social site, characterized by hybrid discourses that mingle genres such as jokes and social chat with the formal registers of quasi-academic talk and writing.
2. The development of the concepts also emerges from student-to-teacher conversations.
3. The developing elaboration of the specific concepts in play refers backward to prior experiences of popular cinema, and moving image and media cultures more generally.
4. It also refers forward to changes in the students' sense of the pleasures of film and aspects of their identity in relation to this.

Yet in the examples in this chapter, we also want to say that we creatively transform the uses of the technology. The emphasis here is not on making for its own sake, but on forms of analytical production. The use of *Moviemaker* to analyze shots in *Psycho* is a long way from the intention of the software developers when they, like the makers of *i-movie*, decided to incorporate scene detection and split the source material into clips. But we consider this use of digital technologies to anatomize media texts to be a creative exercise and, more important, so do the students who do this work. If conceptual languages are subject to contestation and transformation, as in the move from traditional moving image grammars to a multimodal framework, for instance, then so are the semiotic tools of moving image production. These semiotic tools build on key affordances of the digital medium—in particular,

the principle of variability that allows both the analytical decomposition of these film texts and the iterative editing process of new compositions.

Finally, a word about media literacy. If literacy implies the reading and writing of the media, as many have said already, then reading and writing are inextricably related and mutually reinforcing. But the reading and writing analogy can be misleading, not least because it oversimplifies the communicative and representational work at stake here. Our examples here show how young people listen, think, draw, talk, design, produce, present, and write; and how they do all these in a complex web of hybrid discourses, shuttling among the languages of their peer group and the school, the home, and the academy, the private and the public, to say what they want to say. We need to understand these multimodal processes better—how the images in a film become the words of the teacher, become the jokes of teenagers, become abstract ideas in a diagram or, differently, in a piece of writing, or become new moving images composed in Premiere. We need better understandings of how, through these hybrid, context-sensitive forms, children gain increasingly sophisticated understandings of the familiar media texts they live with, as well as the less familiar ones school can introduce to them. Kress and van Leeuwen (2000) argued that reading and interpretation is a form of design, and these students' reworkings of *Romeo and Juliet*, or re-presentations of *Psycho*, are good examples of this.

We also need to discuss what kinds of grammar of the moving image are best suited for work with school students. The well-understood notions of *mise-en-scene* and the conventions of the continuity system elaborated by Bordwell and Thompson are certainly a start and certainly what students will also move on to if they take up specialist film studies or media studies at a later stage. However, these systems do not always cope well with the multimodal complexity of film texts—of, say, the articulation of the rhythms of speech with the rhythms of music and editing (van Leeuwen, 1985), or the articulation of dramatic gesture with editing, which at least one of the students in this study is already dealing with.

These discourses and production practices, these anatomies and reassemblies, are the activities of the space between the domestic and professional spheres. The use of both the conceptual language and the digital tools locates such work in the interstitial space suggested earlier—the quasi-professional realm in which education, like amateur elites, bridges the gap between the domestic and professional spheres. In these spaces, children and young people can experiment with projected identities (Gee, 2003)—a sense of themselves as graphic artists, animators, film makers, cartoonists, and game designers. But they can also experiment with critical and analytical roles: the role of the critic, media analyst, or even the academic. But dipping a toe in these waters need not mean the loss of their ordinary uses of and pleasures in the stories, games, and fantasies of the media. This experi-

ence, this knowledge, and the anatomical and compositional skills learned in education make up the cultural capital of children and young people. It is a joint enterprise between school and the wider media culture; the two need each other, and it is our job to make the connection.

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