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Journal article

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**Mills, Kathy A.**

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For the publisher's version, see:

Mills, Kathy A. (2010). “Filming in Progress” : New spaces for multimodal designing. *Linguistics and Education*, 21(1), pp. 14-28.  
<https://doi.org/10.1016/j.linged.2009.12.003>

Mills, K. A. (2010). Filming in Progress: New Spaces for Multimodal Designing. *Linguistics and Education*, 21(1), 14-28.

## “Filming in Progress”: New spaces for multimodal designing

*Kathy A. Mills*

### Abstract

Global trends call for new research to investigate multimodal designing mediated by new technologies and the implications for classroom spaces. This article addresses the relationship between new technologies, students’ multimodal designing, and the social production of classroom spaces. Multimodal semiotics and sociological principles are applied to a series of claymation movie-making lessons in an upper primary school in Australia. The analysis focuses on the social meanings embedded in the multimodal spaces of the classroom—dialogic, bodily, embodied, architectonic, and screen spaces. The findings demonstrate how the uses of new technologies and the students’ multimodal learning were tied to important transformations of space.

The teacher of a Year 6 class walked toward an innovative filming studio in the corner of the classroom. In the centre of the studio was an intricate three-dimensional representation of a beach scene, including plasticine figures standing on a sandy shore. The model was illuminated by natural light that entered from the windows, while two lamps were carefully positioned on either side of the model, facing inward. Directly in front of the model, a tripod supported a digital camera angled slightly downwards toward the multimodal display. The class was seated on the carpet behind physical boundary markers around the filming area. The teacher addressed the students:

- Teacher: Your floor area will be here. I’ve got these little signs saying “Filming in Progress” and “Quiet Please” there, because this area will be completely out of bounds when filming is happening. I’ve got a lamp that is going to be turned on here [points to the lamps]. Why? Why do you think I’ve got a lamp that is going to be turned on here? Rhonda?<sup>1</sup>
- Rhonda: For the light
- Teacher: What about the light?
- Rhonda: So you can see?
- Teacher: What do you notice about this light when I’m moving?
- Sharelle: There’s shadows.
- David: Shadows
- Teacher: There are shadows. Where are the shadows coming from?
- Julie: The light through the windows
- Teacher: The light coming through the window is very bright. So to balance that, we need light coming from this direction, because we really don’t need your shadows in the movie. So if we had two lamps that are shining this way, then it will give some of your characters depth and dimension. Ok? Lighting is very important.

The dialogue above illustrates how claymation movie-making involves innovative arrangements of the classroom space associated with the technologies for meaning-making. For example, the teacher explained how lighting must be consistent from the beginning to end of each scene, which can be facilitated by desk lamps to illuminate the movie stage. She explained that the tripod and digital camera must be horizontally and vertically aligned with the set to be filmed. Particular floor space was necessary for groups of students to simultaneously shuffle between the movie set and the tripod. The teacher established new material boundaries to separate new classroom spaces from the old. To a large

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<sup>1</sup> All Names in this paper are pseudonyms to protect the identify of the participants.

extent, multimodal designing is mediated by new tools, media, and classroom spaces, while existing components of the classroom are similarly transformed.

## 1. Research Focus

This article addresses the relationship between new technologies, classroom space, and students' multimodal forms of representation. The findings in this article demonstrate that the use of technologies, from pencils to PowerPoint, influences the ways in which learning is mediated (Morgan, Russell, & Ryan, 2002). Furthermore, the semiotic potentials of students' engagement in multimodal designing both transform, and are transformed by, the classroom space (Jewitt, 2006).

Following Soja (1989), the organisation of the classroom space is seen as a social product, since it arises from purposeful social practice. Social space incorporates social actions, both individual and collective (Lefebvre, 1991, p. 33). Space is not seen here as a separate structure with rules of construction and transformation that are independent from the wider social framework. The organisation and meaning of space is a product of social translation, transformation, and experience (Soja, 1989, p. 79). The various kinds of spaces referred to in this paper are united by the condition of being socially produced. Whether it be the form, content and distributional patterns of the built environment, the bodily orientations of the students to learning, or the visual and spatial layout of the screen, all spaces are rooted in social origin, and filled with social meaning (Soja, 1980). Additionally, space and the social organisation of space are considered here as dialectically interactive. In other words, social relations of production are both space forming and space contingent (Soja, 1989, p. 81).

This work has relevance for educators, who desire to understand the semiotic potentials of multimodal production, mediated by new technologies, which catalyse both the transformation of the learners and learning space. For linguists and English teachers, the import of this work is to recognise the semiotic characteristics of different modes that are orchestrated in multimodal spaces as social products.

I position classrooms as “multimodal texts” because classrooms, both traditional and new, are three-dimensional built spaces that contain a complex ecology of social actors, discourses, power relationships, cultural artefacts, symbolic systems, architectonic meanings, and technologies that form a multimodal composition. A multimodal analysis of classroom space requires a theory of meaning that extends beyond linguistics, since the spoken and written word have never been exclusive forms of communication in classrooms, nor indeed in social contexts outside of schools (Kress, 2000a, p. 153).

A significant body of international research has examined the intersection of multimodality and social context in very specific and nuanced ways (Gee, 2003; Hull & Nelson, 2005; Janks, 2004; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Lankshear & Knobel, 2003a, 2003b; Mackey, 2003; Newfield & Stein, 2000). These theorists contend that digital technologies have decisively changed antiquated notions of language, curriculum, and literacy research. Texts are increasingly multimodal, that is, they combine visual, audio, linguistic, gestural, and spatial modes to convey meaning in a richer way. Multimodal design differs from independent modes because it interconnects the modes in dynamic relationships and involves the whole body in making meaning (Cope & Kalantzis, 2000; Kress, 2000a, 2000b; Kress & van Leeuwen, 1996, 2001). It is not merely that literacy tools have been altered: Texts, language and literacy are undergoing crucial transformations through the affordances of new digital technologies for image and sound manipulation.

Below I investigate, describe, and analyse the way in which a group of Year 6 students (aged 10–12 years) and their teacher drew upon digital technologies and “modal affordances” – the potential of modes for representation and communication – to mediate the use of the learning environment during a series of claymation movie-making lessons (Jewitt & Kress, 2003, p. 14). The significant findings about multimodal uses of the classroom space as a social product are highlighted. In particular, five categories of social space are discussed—dialogic, bodily, embodied, architectonic, and screen spaces.

## 2. Research description

The research was conducted in a Year 6 classroom in Australia comprised of students who were ethnically and socio-economically diverse. There were twenty-three students – eight females and fifteen males – who were divided into groups of three or four to collaboratively design clay animation movies.

### 2.1. Teacher

A lecturer identified potential teacher participants for the research through a professional development project. Four teachers were involved in a pilot study investigating students' access to technology-mediated, multimodal learning<sup>2</sup>. The research was trialed for four weeks of continuous observation in the classroom of a selected teacher who demonstrated specialist knowledge and expertise in new, digitally mediated, multimodal textual practices. She had showcased her students' digital, multimodal products at Australian educational conferences.

### 2.2. Research methods

Ethnographic research was used to investigate students' multimodal designing during a series of new media-based lessons. Print-based literacy lessons that addressed conventional narrative writing skills were also observed. Data collection involved 18 days of classroom observation and continuous audiovisual recording by the author over a 10-week period resulting in approximately 36 h (250 h of verbatim transcription by the researcher). Field notes, a self-reflexive journal and collected cultural artefacts, such as school policy documents, work samples, and photographs, were also used to triangulate the data.

I conducted semi-structured interviews with the principal, teacher, and four students. The interviews examined issues about access to multimodal designing in the school and the students' homes and communities (see Banister, Burman, Parker, Taylor, & Tindall, 1995; Denzin, 1989). I also recorded informal discussions with the teacher and students at various times, encouraging critical reflection through a dialogical process that aims to empower actors in social settings and gain insider perspectives (Carspecken & Walford, 2001; Lather, 1986).

### 2.3. Objectives

The aim of the unit was for learners to collaboratively design claymation movies that communicate an educational message effectively to parents in the community, and to the students' younger "buddies" in the preparatory school (age 4–5 years). The themes were to arise from the students' own interests to allow them to design original multimodal texts. The students could choose an appropriate genre from those covered previously in the curriculum (e.g. narrative, instructions, or news report). When the teacher evaluated the movies, she considered the aptness of the movie for the target audience, correct use of film-making and linguistic conventions, the degree of collaboration, and the extent of creativity. Claymation movies involve an animation method in which static clay figurines are manipulated and digitally photographed to produce a sequence of life-like movements. The process occurs by shooting a single frame, moving the object slightly, and then taking another photograph. The objects appear to move by themselves when the film runs continuously. *Wallace and Gromit* and *Chicken Run* are well-known claymation films. The movie-making process involved planning a storyboard, sculpting plasticine characters, designing movie sets, filming, and combining music or recorded script with the film clips. After filming, the students digitally edited the movies with teacher assistance (see Table 1).

Open-ended aspects of designing included choosing the genre, theme, message, number and type of scenes (e.g. indoor/outdoor), characters, events, set and prop materials (e.g. fabric, paint, sand), spatial layout, photo composition, and duration of the movie. Audio elements could involve background music, digitally recorded speech, sound effects, or combinations of these elements to accompany the moving images. Title pages, credits, and subtitles could include unlimited spatial layout options, backgrounds, contrasts, fonts, colours, graphics, and digital effects.

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<sup>2</sup> Voluntary, informed, written, and understood consent was obtained from relevant departments and participants to be involved in the ethnographic study.

<b>Claymation Movie-Making</b>	<b>Time</b>
<b>View Claymation Movies</b> Teacher displays movies from other students and discusses the strengths and weaknesses.	1 hr
<b>Critiquing Claymation Movies</b> Teacher guides students to analyse critically analyse the claymation movie “Chicken Run”.	1 hr
<b>Storyboard</b> Discuss plan for movie plot, scenes, characters. Allocate roles. Record ideas using picture frames and labels. List materials required. Create movie title.	2 1/4 hrs per group
<b>Set Design</b> Plan and create three-dimensional dioramas with backdrop, stage, and props using real objects and mixed media.	4 hrs
<b>Character Design</b> Create three-dimensional characters by sculpting plasticine on wooden figures or by using mixed media.	2 hrs
<b>Rehearsing</b> Rehearse movements and determine photo schedule. Set up filming area, matching set proportions to camera angles.	1 1/2 hrs
<b>Filming</b> Take 60-200 digital photos of the movie sets using a tripod while moving the characters and objects gradually. Control lighting and position of the tripod. Change expressions and gestures of characters. Take close ups & long shots.	2-4 hrs per group
<b>Sound</b> Write and rehearse script to match visual elements and/or select digital music files to match visual elements. Record script (speech) digitally using computer and microphone.	2 hrs
<b>Digital Editing</b> Use digital software to combine images and sound files, and to create special effects, subtitles, title pages, credits, and backgrounds.	1/2 hr per group
<b>Presenting Movies to Community</b>	3 hours

**Table 1.0 Claymation Movie Making Steps** (Mills, 2006c)

### 3. Dialogic spaces

The following section highlights a key finding about the creation of dialogic spaces for collaboration observed during storyboard designing. Bakhtin’s (1981) notions of dialogic meaning and “social heteroglossia” – the intertextual and interdiscursive nature of social interactions – are used to illustrate how the classroom became inherently multi-voiced. Bakhtin analysed Russian novels, highlighting the way in which authors speak through the multiple voices of characters rather than a unitary voice. The multiple voices of the characters create the internal “dialogic” meaning of the novel. Dialogue is seen to be constructed between people and languages, and within people and their frames of reference to categorise experiences. His notion of dialogisation describes more than simply dialogue as speech. Social heteroglossia are not only a feature of the narrative genre, but of communication between people in the real world (Fairclough, 1992). In this classroom analysis, participants’ internal dialogisations become significant when they occur together to form the social heteroglossia of the classroom (Gutierrez, Rymes, & Larson, 1995, p. 445).

Classroom examples in this section are drawn from the first stage of the filmic process—storyboard design. In storyboarding, image-text relations – static drawings with writing as a subsidiary mode – are employed to represent moving images that will be realised on the screen (Burn & Parker, 2003).

The principal modes utilised during storyboarding were speech and gestures, as students negotiated their ideas with one another and reported to the teacher. Meanings were then shifted from speech and gestures, as a translation medium of comment, to the provisional notations of images and words on the storyboard. Speech functioned to mediate the experience with symbolic expressions or designs, as well as between the participants, which constituted a socialisation process or induction into the culture of movie-making (Bruner, 1990).

The learning demonstrated by the students included the effective design of storyboards composed of clever cartoons to communicate an initial, coherent and modifiable design for their intended audience. For example, one group of boys entitled

their storyboard “Slip-Slop-Slap”—an intertextual reference to a television health slogan in Australia exhorting people to “Slip on a shirt, Slop on sunscreen, and Slap on a hat” to prevent skin cancer. In their development of the storyboard, they decided that the movie would have three scenes. The main character and central problem were to be introduced in the first scene—the character would be burned from too much sun exposure. In scene two, he would dive underwater among the tropical reef fish to soothe the burns. Scene three would return to the beach, where an animated sunscreen bottle would squirt the man with the liquid. The voice-over would warn the young viewers to “Slip, Slop, Slap”.

The transcript below provides a snapshot of the multi-voiced interactions that occurred during storyboarding between the teacher and the group of boys who created “Slip, Slop, Slap” as she guided them to conceptualise the nuances of creating movement in claymation film-making.

- Jack: Or he’s just standing there, and he’s like that first [gestures holding rifle action]. And then he shoots and then you just see it.
- Mark: You just see a little bit of sunscreen coming out.
- Teacher: So you’re going to have a little bit coming out? How are you going to make it stay though?
- Mark: With a piece of string. Like, just hold it up [gestures holding something suspended on string].
- Jack: Yeah, you could just, like, get something across, and just tie it there if you want it to stay, or something.
- Teacher: You’ll probably need fishing wire then, wouldn’t you – that people can’t see. If it’s real string people are going to see it!
- Nick: [Talking through teacher] Take a photo. Take a photo of something and then put it in.
- Jack: That’d be pretty hard. No, you just, you like, film it like that [gesturing rifle action], and then you see where the white thing is.
- Teacher: Do they actually have to see the bottle spraying. Maybe you could have a close up of your character getting sprayed.
- All: Yeah!
- Jack: True.
- Teacher: You don’t have to have all long shots.
- Mark: Yeah - we could do that!
- Jack: Mmm.
- Teacher: Like the Year Two’s last year had just all long shots.
- Jack: Yep!
- Teacher: There’s no reason why you can’t have a couple of close-up shots with just that character being sprayed. Mark: Yeah, we should have a close-up of him in the movie!
- Jack: Yeah, yeah – let’s do that.

In these interactions the teacher guided the students to consider the design constraints and possibilities for representing movement. Jack’s idea – “No, you just, you like, film it like that [gesturing rifle action] and then you see where the white thing is” – pre-empted the idea of using “before” and “after” shots (rifle action and consequence). This cinematic technique allows the viewers to infer that the sunscreen has been sprayed rather than observing the movement of the liquid. The teacher elaborated Jack’s idea by asking the rhetorical question, “Do they actually have to see the bottle spraying?” Through this dialogic process, the teacher guided the learners to realise how scenes can be structured as “alternating syntagmas”— shots that switch between different characters participating in a single interaction (Iedema, 2002).

The teacher then introduced a key affordance of camera angles: “Maybe you could have a close up of your character getting sprayed”. Close-up shots make possible the selective indication of important details, and can be used to indicate social proximity (Kress & van Leeuwen, 1996). Interestingly, the boys had depicted all frames on the storyboard as long shots, continually representing their ideas as whole figures against backgrounds. They did not consider the possibility of representing objects from different angles.

Here, the students had the opportunity to incorporate their own stories into larger multi-voiced classroom narratives. Following Bakhtin (1982, p. 263), the teacher and students had various internal dialogisations of their own cultural experiences, which became evident through external dialogue. When these dialogisations were made available to each other,

they became the social heteroglossia of the classroom (Bakhtin, 1982, p. 272). Heteroglossia involves a dialogic pedagogy that generates multiple perspectives, positioning students as more than passive recipients of the teacher's monologue.

These lessons represented a significant historical, pedagogical, and social shift for the teacher, whose individual practice and the practices observed in the school, reflected the dominant discourse of teacher monologue that has been traditionally valued in Western classrooms. The interactions differed from the direct instruction observed in other lessons, when the teacher's monologue presented to the whole class "closed the internal discourses" of the classroom participants to change or elaboration (Bakhtin, 1982). For example, earlier literacy lessons had involved the students in listening to the teacher's explanations of grammatical rules and then silently completing written exercises from the blackboard into their individual writing books. It demonstrates how collaboration among students can be a central force in the creation of multimodal texts.

A growing body of research on collaborative learning has shown the benefits for children working with other children and expert guides in collective learning efforts (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Rysavy & Sales, 1991). Similarly, in this study, when the students collaborated they reflected on the ideas of others, viewing their peers and the teacher as co-participants and sources of complementary skills and knowledge (Strommen & Lincoln, 1992). Collaborative multimodal designing created new dialogic spaces of authorship, engaging continual interactions between the teacher, students, and the students' designs (Bakhtin, 1982).

#### **4. Bodily spaces**

This section demonstrates how designing claymation movie sets and characters was tied to the production of specific bodily "displays of orientation"—participants' uses of gaze, posture, gesture and other modes of communication to suggest varying degrees of engagement with curricular objects and individuals (Bezemer, 2008). It examines how holistic, bodily bases of meanings are expressed through multimodal forms of communication that accompany the linguistic elements of speech acts (McNeil, 1992). This extends the work of theorists such as McLaren (1993) who forged the analysis of bodily postures and gestures as a key to interpreting social relations.

When the storyboards were completed, the students began designing three-dimensional movie sets and characters using a variety of mixed media (e.g. paper, paint, cardboard). Movie props consisting of manufactured or natural materials were positioned on a "stage" (base) with a painted backdrop for each indoor or outdoor scene. The characters were created using plasticine and fabric on pre-formed wooden figures.

Students also rehearsed the movements of the plasticine figures in preparation for filming. This involved moving the plasticine figures and props along spatial trajectories on the stage to represent the sequence of movements and gestures in the movie narrative. The functional load of the set and character designing, along with the rehearsal, was realised by the affordances of visual, spatial, and gestural modes. Speech was used by the students to mediate their ideas collaboratively, while they shaped the tangible media using only their hands or conventional art tools (e.g. brushes, pencils, scissors).

The lessons for movie set and character design were divided into two main lesson frames—direct instruction and engagement in the task. The short verbal explanations addressed how to create a movie base and backdrop, props, and plasticine characters. The teacher provided tangible examples of movie sets that were under construction by students in another class. The gaze of the student group predominantly formed a single line of action to the teacher as they listened and observed. This was followed by fifty minutes per lesson for the students to collaboratively design their movie sets and characters. During this frame, the students had unbounded and flexible use of the learning space. They could choose to sit or stand with or without furniture, on the floor, at group tables, or at their desks. The learning space became a non-linear composition, since it led the viewer's eye to multiple "reading paths" of the classroom as a multimodal text (Kress & van Leeuwen, 1996, p. 220–221).

Here, I use Kress and Van Leeuwen's term "reading paths" in the context of reading a printed visual text, as a metaphor for interpreting the multimodal discourses, design, and production of classrooms. This is because classrooms are social spaces in

which historically, socially and culturally located activities and knowledges can also be “read” or decoded, being socially produced. Interpreting such spaces implies a process of signification. The teacher engaged the children by assisting them to take initiative in their own self-directed learning. The teacher worked with one group at a time, seated alongside the students at “eye level”, making them appear to be “symbolically equal” (Kress & van Leeuwen, 1996, pp. 116–123, 136). The gestures and posture of the teacher reflected the move away from a hierarchic structure of classroom organisation, to a more egalitarian, collegial structure where the ideas of the students were given greater recognition in the learning process. The teacher served as a guide, rather than the sole source of knowledge (Ringstaff, Sandholtz, & Dwyer, 1991).

The interactions within the classroom were diversified in multiple directions as the students simultaneously pursued different paths to realise the teacher’s overarching goals for movie set and character designing. Displays of orientation became a complex web of engagements within the students’ simultaneously operating frames (Norris, 2004; Schefflen, 1973). The students’ limbs frequently formed vectors connecting them to the media, tools, and the goal of designing such as the plasticine figures in their hands. These displays of orientation indicated that the multimodal products that they were fashioning were the focus of their interactions. At other times, students’ movements and gaze were vectors unifying the participants in each group as they negotiated meaning through speech, while making external reference to their material designs. The students were positioned at frontal or oblique angles to one another, blending degrees of “engagement” (frontal angle) and “detachment” (oblique angle) (Jewitt, 2006, p. 47). A narrative structure of action was observed during collaborative designing that was predominantly “bidirectional”—the students were connected to one other by lines of action that were reciprocal (Kress & van Leeuwen, 1996, p. 59).

The significance of these bodily orientations is that the students’ proxemics – their gaze, posture, and tilt of the head toward one another – indicate that they were simultaneously and productively interacting with their peers, while creating the designs in their hands (Norris, 2004, p. 48). In this way, shifts in multimodal displays of orientation were a holistic, bodily indication of their collaborative learning and social relations. The teacher’s goals for claymation moviemaking were sufficiently open-ended to allow the students’ multidirectional, productive engagements with curricular objects and individuals around them. This contrasts the discourse of teacher-initiated direct instruction commonly observed in Western classrooms, which narrows the range of appropriate “bodily displays of orientation” by the students (Bezemer, 2008; Gee, 1996; Mills, 2007). For example, during the teacher’s instruction, students are frequently required to orient their bodies to “look like listeners”, sitting upright, keeping their limbs and hands to themselves, and with their gaze primarily concentrated on the speaker—the teacher (Goodwin, 1981; Mills, 2007).

In contrast, collaborative multimodal designing of claymation movies required diversified displays of orientation toward their peers, their multimodal products, and the mediating tools and resources for designing. The multiple displays of orientation were aligned with the students’ directives and means for designing, which in turn, were consistent with the teacher’s open-ended goals oriented toward the students’ productive and creative designing. The classroom became a social space in which the students’ bodies provided holistic, bodily expressions of collaborative learning and engagement in new forms of multimodal designing.

## **5. Embodied spaces**

This section addresses the embodiment of the students’ ideas and social experiences in the material design of their claymation characters, a multimodal outcome of the students’ learning. Building on work by Leander (2002) and Stein (2006), who explore the use of artefacts in the multimodal construction of identities in various classroom settings, it illustrates how the students used visual and spatial resources to reflect their forms of identification, that is, plural “sites of the self” (Holland, Lachicotte, Skinner, & Cain, 1998). I argue that the students construct their sense of identity by producing identity artefacts with multimodal means, and in so doing, projecting social space. For example, the main character of *The Healthy Picnic* movie was designed by a Sudanese girl, Darles, who arrived in Australia as a refugee. There were striking resemblances



between Darles' own physical markers of identity and those of the figure, such as her African skin tone, traditional African hair braiding, and prominent lips.

Similarly, the four girls who created the movie "The Case of the Disappearing Pimples" saw the characters as representations of themselves. The following interaction shows how the girls negotiated roles in the movie narrative.

- Emma: Or do you want a girl eating lots of chocolate and getting pimples?  
 Sarah: And then she starts eating healthy food, and the pimples start to go away. Emma:  
 Meliame can be the girl with the pimples.  
 Elizabeth: Yeah, because she's not here. Sarah:  
 No, 'cause she's the boy.

Implicit in this dialogue is the girls' perception that the characters were essentially representations of themselves. In Meliame's absence, the girls attempted to assign their least preferred roles—the character with pimples and a boy. The final outcome was an all-female cast, including a girl with pimples, who was played by Meliame. Animated characters can be referred to as anthropomorphic agents, embodied agents, or life-like characters (Kipp, 2005, p. 11). These agents embodied the girls' existing semiotic or cultural resources—their background experiences with the world, with language, with texts, and with others. For example, the plasticine costumes of the four embodied agents mirrored the appearance of the four girls, such as their long hair and short skirts. In this way, the girls used visual and spatial resources to reflect and define their own identities through the characters, each member contributing elements of their personal history and culture (Kress, 2000b). It was evident that the girls drew from multiple cultural contexts in their multilayered life worlds. For example, when I asked the girls to tell me about the characters in their movie, the girls replied:

- Elizabeth: We're like, the "Fab Five!"  
 Sarah "Queer Eye."

The "Fab Five" is an intertextual reference to the actors in a reality television series called "Queer Eye for the Straight Guy". The program centres on five gay men who do makeovers to improve the grooming of heterosexual men. Like the television program, "Queer Eye for the Straight Guy", the central theme of the girls' movie hinged on the problem of maintaining a flawless image. In *The Case of the Disappearing Pimples*, a pre-teen female is seen agonising over an outbreak of pimples following a party in which she consumed too much "junk food". Her friends assist her by shopping for healthy food and recommending Clearasil skin products in the process of her image "makeover". When the cosmetic changes are complete, the girls celebrate her transformation and affirm her beauty.

Through the process of multimodal designing, the girls transferred the theme of "image" from the location of popular media culture and its stereotypes, to situate these meanings within their pre-teen world. Their movie echoed the dominant messages in the media that market females as embodiments of ageless beauty, rather than as individuals possessing personality, intellect, creativity, spirituality, social and physical abilities, and economic or political esteem. Their movie was an intertextual universe connecting TV programs and media consumption to their pre-teen culture. This cultural production of virtualities made space for the emergence of an imagined, refigured world, involving cross-cultural dimensions of meaning-making (Pahl, 2001).

These examples demonstrate how multimodal semiotic resources are configured together to shape identities. The students drew upon the many layers of representational resources available to them from multiple cultural contexts. The process of film-making mediated their perception of their own identities, restructuring their social relations, experiences, and knowledge. It required taking knowledge and capabilities from one setting, and adapting them to their own lifeworlds and identities with inventive artistry and fusion (Kalantzis & Cope, 2005). Through the physicality of the props and figures, such as the weight, size, shape, texture, and form of the plasticine figures, they became "embodiments" of the "ideas and images in the children's minds", while simultaneously being shaped by their social environment (Stein, 2006). The embodied spaces created by the students reflected the social spaces and reshaped worlds within which they collaboratively engaged.

## 6. Architectonic spaces

This section focuses on transformations of the architectonic meanings of the classroom – its material qualities of design and structure – such as spatial arrangements of classroom furniture, during the filmic stage of claymation production. Background information is provided about the filmic instruction and the students’ trials and errors in the filming engagement in designing to contextualise the findings about the new meanings of the material classroom space. The teacher introduced the functions of the filming studio in a fifty-minute lesson of direct instruction, while the students sat on the floor facing the studio. Occasionally, she would invite students to interact with the tools and learning objects within the studio, providing a multimodal demonstration to the students who observed. Filming involved the pupils and teacher in bodily interactions with both everyday (e.g. lamps) and cinematic objects (e.g., digital camera, tripods).

When demonstrating the use of the digital camera and animating characters, the demeanour of the teacher’s body, what Bourdieu (1991) terms “habitus”, embodied “being a cinematographer”. For example, the teacher switched from her upright posture and gaze on the students as classroom teacher, to face her body away from the class toward the tripod, directing her gaze on the camera lens pointed toward the movie set. Her limbs and hands formed trajectories toward the technical tools for production, as she expertly adjusted the camera angle. These bodily meanings accompanied the linguistic elements of her speech acts. The teacher spoke like a cinematographer, using terms such as “camera angle,” “aerial perspective”, “alignment”, “audience”, and “viewpoint”, drawing upon cinematic historical traditions and knowledge. She demonstrated a respect for the technology, and showed understanding of the specialist practices for movie production, such as controlling the lighting and animating the anthropomorphic agents or figurines.

The students then took turns viewing the movie set through the lens of the digital camera, and practiced animating figures on the movie set. They were given the opportunity to practice being cinematographers, film directors, and animators, making sense of the “habitus” of these professional roles through imitation of the teacher. By engaging bodily in the multimodal filming process, the students adopted the appropriate ways of acting, talking, and moving like expert cinematographers. Certain students were assigned the role of “movie directors”, which required keeping a photography schedule or logbook of the photos and movements in each scene. In this manner, the students were constructed as cinematographers, directors, and animators through handling specialist technologies within the studio space.

The organisation of the classroom timetable was altered by the teacher to allow the students to film in continuous blocks of up to four hours. This was tied to the technical requirement for filming to occur in an environment with constant lighting conditions. These changes are significant because the school timetable is fundamental to the mobilisation of space, historically establishing the coordination of time-space paths. Like all disciplinary organisations, schools operate with precise economy of time established by administrative authorities, both within and beyond the school. Filming claymation movies required transformations of historically established internal regionalisation or routine time-space paths (Giddens, 1984).

Movie filming occurred in the only available space in the room—the periphery. The location of the filming area has significance in terms of the “informational value” of centre and margins in spatial layouts (Kress & van Leeuwen, 1996, p. 203). It reflected the dichotomy between the teacher’s goals for multimodal designing and the priority given to conventional English lessons in the school curriculum.

On the one hand, the filming area had subordinate status to the nucleus of information and activity in the centre, where students continued to draw upon conventional, print-based media and tools of inscription for a greater proportion of each school day. Conversely, the periphery gained new importance as a specialised and protected space for designing. While the filming area represented what is new, ideal, and innovative, the existing constraints of the school curriculum, timetable, and furniture were historically tied to oral and print-based forms of communication.

The visual framing of the filming area – the spatial boundaries and conjunctions between zones that separated it from other spaces in the room – was significant. Explicit physical boundaries were established to minimise bodily and audio interferences from students in other groups. This was tied to the need for a constant camera position and consistent lighting during filming.

Freestanding cardboard signs formed a literal and figurative line along the floor, with the words “Filming in Progress” emblazoned on a red background. These spatial boundaries were reinforced by vacant space around the perimeter of the filming area, reflecting the status of the filming area as a protected space for specialised designing.

A central issue here is that the technical requirements of claymation filming required considerably different architectural spaces – new configurations of the classroom furniture, lighting, and built environment – to those required by conventional forms of representation, such as writing with a pencil and paper at individual desks.

These architectural meanings framed the filming activities, and were suggestive of the potentials and constraints on the roles and relationships of the students as designers, and their bodily displays of orientation toward the mediating technologies and their cultural products (Kress et al., 2005). These potentials and constraints on the learners as designers are explored below.

The visual framing of the material classroom space – the spatial boundaries and conjunctions between zones that unite or separate elements – was the most amorphous during filming. While one group at a time occupied the filming studio, groups of students were randomly dispersed throughout the classroom as they completed their movie sets and characters, or rehearsed their script and animations. The weak visual framing was combined with low levels of enclosure, which refers to “the protected space of disciplinary monotony” in which areas are confined, limiting disturbances (Foucault, 1977, p. 141). For instance, students could visit the workspaces of other groups to view their movie sets. This contrasted lessons involving direct instruction in which students sat at assigned desks facing the teacher, with tightly restricted movements and gestures.

An important quality of the social space during filming was the minimal use of partitioning—“allocating individuals to their own space, eliminating groups, and regulating movement” (Foucault, 1977, p. 143). For example, several boys were normally seated at isolated desks at the front of the room to prevent them from interacting with peers during direct instruction, while the others were positioned side-by-side facing the front of the room to focus on the teacher. Conversely, during filming, students were scattered throughout all spatial zones of the classroom, with groups defining their own work spaces. Power is seen here as constituted through the architectural configurations of space. The low regulation of spatial distribution by the teacher – framing and partitioning – was representative of the shared distribution of power and control among the participants in the multimodal designing process as a productive community of practice.

These architectural patterns – the material space and its meanings – are significant because they functioned to frame the students’ interactions. For example, in the following transcript the boys transform meanings embedded in their static movie sets and characters, to add the dimension of time through a three-dimensional sequence of movements. The boys stood facing the digital camera, which was mounted on a tripod and angled at the first movie set on a desk.

Jack: Ready? [He takes two photographs. The other boys simultaneously merge toward the movie set to move figures, hands reaching awkwardly toward the characters on the set.]  
 Jack: Right, good! Now, some seagulls. Just move it really, really carefully! Nick:  
 That’s all right. [One bird fell off]  
 Mark: Well, one could have flown away! Nick:  
 Move the umbrella.  
 Mark: No – don’t move the umbrella. Put the umbrella down! Matthew:  
 No, it’s got to be [moved] a little bit. *A little bit!* [shouting] Nick:  
 Oh! This is going to be [sigh].  
 Mark: Ah, where’s the other seagull gone? Matthew:  
 Ok, don’t move them too much! Jack:  
 Have you moved everything?  
 Mark and Nick: Yes.  
 Jack: And the man? Mark:  
 We moved him!  
 Jack: Can’t you move the shells? Mark: No  
 – the shells don’t move!  
 Nick: Matthew! You just moved everything I did, which means they just moved twice! Jack:  
 All right, everyone – crouch down!  
 Nick: Down, Mark! [Everyone stands out of the line of action between the camera and movie set, crouching low to prevent shadows.]  
 Matthew: Why is the man lying down? [A figure has toppled over.] Mark:  
 Don’t worry. You can just delete that photo – the teacher said. Jack: Do

you want to delete it now?

Nick: Do you know *how* to delete it?

Jack: No, we'll just delete it later! [Mark touches camera to experiment.] Jack:

Oh, wait, wait, wait!

Mark: Yes, start it. Press that! Nick:

No don't – just in case!

Nick: I don't know how to delete it – just don't touch anything!

Teacher: [Overhearing] Don't worry about deleting any photos now. We'll do it last when we're in the editing process.

When interacting within a new physical classroom space these boys appropriated their material surroundings in ways that constitute a new spatial order to produce a multimodal text. The architectonic structures (e.g. lights, filming studio), technologies (e.g. camera, tripod), and the students' bodily uses of the physical space (e.g. moving between the movie set and camera, crouching down to reduce shadows) mediated the participants' situated experiences of multimodal designing (Lebaron & Streeck, 1997). This spatial order contrasted writing lessons in which the students sat silently at their desks using the familiar “technology” of the pencil, while unable to move or speak without being nominated by the teacher.

The above interactions also demonstrate how the boys initially encountered several design constraints as they transformed the pre-filmic elements of their movie – the static movie sets and figures – to become a “kineikonic” or moving text (Burn & Parker, 2003). For example, the boys were unable to realise the technical affordances of the claymation technology, such as deleting photos on the digital camera (“Do you know how to delete it?”).

Another challenge when designing the movie's temporal axis was visualising or predicting how the accretion of still photos and the repositioning of the objects in each shot related to specific variables of movement, such as direction, fluidity, and speed. Burn and Parker (2003) note that this visualising process is a common difficulty for primary students when designing animations. This constraint was coupled by the unspecified nature of their informal roles and responsibilities. While Jack was the designated photographer, the other group members shared the role of moving the figures in consistent, continuous, and predetermined spatial paths. This resulted in the random shifting of figures in back-and-forth motions, rather than in purposeful trajectories (“You just moved everything I did, which means they just moved twice!”).

The transcript above is only a snapshot of several hours of dialogue between the boys as they continued to film their movie. The following vignette occurred towards the end of filming. It demonstrates the way in which these constraints were overcome as the full potentials of the new technologies and architectonic spaces were realised.

Mark: The sunscreen man is too far away. Come in a bit! And that dude is really looking tall [in relation to the other characters]. Jack: You reckon? [The boys stand back and survey the movie set.]

Nick: [Moves to look through lens] It needs to be zoomed out. Adjusts zoom function on camera]

Jack: Does it? Mark, can we put his arms like that? [Animates the arms of the plasticine man so that they appear to be swinging] Mark: Ok.

Nick: It's zoomed in now. [Moves back from camera]

Mark: [Moves behind camera as Nick moves away] Oh – actually, just move him back a bit further [the main character]. Jack: [Moves the character]

Mark: Yeah. There, there, there! [Pleased with composition]

Nick: Zoom in a tick. Zoom in a tick [Moves to stand with Mark on the sidelines].

Jack: No – just wait. [Adjusts the position of some background animations to sustain rhythms of movie] Ok. Mark:

Go! [Nick takes photo.]

Mark: Again.

Jack: Make sure it's even.

Mark: Now [Nick takes second photo. Two photos of each shot must be taken.] Nick:

That's two [Walks over to Matthew, who is recording].

Mark: [Brushes his hands together as if congratulating himself and the team for a job well done] Matthew:

[Dutifully records on the photo schedule]

Here, film-making entailed the deliberate manipulation of symbolic material within socially organised practices among the group. Mark applied his competency with visual and spatial design to achieve balanced proportions of objects within the screen layout. Nick applied his technical knowledge of the digital camera functions to frame the photo composition. Jack applied his knowledge of gestural design to create realistic animations, while Michael accurately maintained a log of the shots taken within each scene.

Filming required the boys to engage in new ways of learning that drew upon the complex transformation of modal meanings embedded in still images and models to moving images of the screen via new technologies. The boys were learning what was required for situated film-making, including knowing the properties of the modes (e.g. visual, spatial, gestural), media (e.g. claymation moviemaking), technologies (e.g. digital camera), and the social norms for collaboration (Murray, 1997). The potential for designing was not merely contained in the visual, spatial, gestural, and linguistic resources employed by the boys, but “in between” them—through the way in which the semiotic modes were combined to make multimodal meanings (Nelson, 2006, p. 57).

Unlike spontaneous casual conversation or play, manipulating three-dimensional objects during filming is seen as “volitional” (Vygotsky, 1987), involving a conscious choice of signs to render meaning. Film makers do not turn inward to invent these signs; they turn outward, choosing and re-accenting signs from the modes, media, and cultural resources to which they have access (Bakhtin, 1981). The transformation of existing symbols to produce new meanings was basic to the symbolic activity of film-making. Such recontextualisation entailed translating material across different symbolic modes (e.g. spatial, visual, gestural), while negotiating different mediating technologies, with varied interactional contingencies as the boys negotiated meanings for their purposes (Dyson, 2003).

Clearly, the integration of new multimodal forms of production would have been unachievable without transformations of the material space and organisation of the classroom. Resourceful and flexible alternations to the architectonic functions and meanings of the classroom space, such as the filming studio and its technologies and the students’ appropriation of those spaces, were required for students to be inducted into hybrid, specialised digitally mediated multimedia design. The generation of new material spaces opened up the potential for representing a multidimensional world through film in a multimodal, technology-mediated, and collaborative way.

## 7. Screen spaces

During the post-filmic stage of claymation designing, screen spaces became an important site for the students’ representations of meaning. Screen spaces refer here to the socially constructed spaces of screen-based media. An analysis of the students’ movies during digital editing demonstrates the centrality of, and complex relationships between, word and image on the screen. Secondly, it highlights the working of power in the depicted character relations. Linguistic design elements of the screen space were added during digital editing of the movies, including the title, transitions, subtitles, and credits. Examples are shown from the students’ designs to demonstrate how the act of

Scene 1- Party	<i>“Let’s party and dance!”</i> [Jazz piano music]
Insert – Close up	<i>“Oh, I’ve eaten too much fatty food.”</i>
Scene 2- Shops	1. <i>“I’m getting pimples from eating too much junk food.”</i> 2. <i>“Let’s buy some healthy food.”</i> 3. <i>“How about some fruit?”</i> 4. <i>“Look, some Clearasil”</i> 5. <i>“This should get rid of my pimples.”</i>
Scene 3- Eating Healthy Food	<i>“Guess what? My pimples have gone!”</i> <i>“Yeah, you look pretty.”</i> <i>“Thanks.”</i>
Scene 3- Close-up	<i>“Yum, this healthy food is delicious.”</i>
Coda – Movie-makers holding signs to reinforce movie message	<i>“Don’t eat too much junk food!”</i>

**Table 2: Scenes: The case of the disappearing pimples (Mills, 2008).**

writing in screen spaces is clearly more than monomodal. The screen space is a multimodal orchestration of linguistic, visual, and spatial modes (Jewitt & Kress, 2003, pp. 2–5). Unlike the words in much print-based literature, the linguistic elements on the screen are reconfigured with strong spatial and visual elements, such as font style, colour, size, contrast, directionality, and positioning.

For example, between certain scenes in *The Case of the Disappearing Pimples* static transitions created salient conjunctions in the diachronic axis of the visual track to show the relations between successive scenes. In sequences of moving images, time is signified implicitly by boundaries – an abrupt cut of a moment in time – and conjunction – the juxtaposition of a new moment in time. Every transition symbolises a temporal shift of some kind to create an overall effect of rapid action sequences in which time is divided, absent, or condensed (Burn & Parker, 2003).

The transition slides skilfully functioned as timing devices, fast-forwarding the plot to the central events in the narrative. Each indicated a change in spatial and temporal meaning—a new place and time. For example, after the final close-up, the words appeared “The pimples were never seen again”, providing viewers with a telescopic summary of the future. An elegant and embellished Old English font resembling calligraphy was chosen for its aesthetic appeal, and the large written text was centred on the screen using navy blue contrasted clearly against a violet background. Unlike the words on this page that follow conventional fonts and layouts for academic texts, writing on the screen is regarded as a “visual entity” (Kress, 2003, p. 65). Since the screen is most frequently the site of the image, the logic of images dominates its semiotic organisation (Kress, 2003).

The significant issue here is that during digital editing, students learned to attend to the visual and spatial design elements of the screen space. This is because decisions about font style, size, colour, aesthetics, and positioning are as important in communicating an intended message as the letters and words. Screen spaces became a site for learning that meanings in multimedia are not fixed or additive; rather, they are multiplicative (Lemke, 1998). For example, words are modified by images and vice versa. This makes the whole text far greater than the sum of its parts. The students learned how options for meaning from each medium cross-multiply in a combinatorial explosion (Lemke, 1998).

The students used screen spaces to depict character relations, that is, how the movements of people and objects show interactive meanings. For example, “*The Case of the Disappearing Pimples*” was designed by four girls of Australian, Maori, and Tongan descent. The narrative film had three main scenes with two close-ups, bounded by transitions, and concluded with a maxim to restate the message explicitly to the viewers: “Don’t eat too much junk food” (Table 2).

During the creation of the movie, the girls decided that their plot required the brief appearance of a fifth character. The teacher permitted the girls to borrow a figurine of similar quality of workmanship from another group, negotiating this decision with Darles. During scene three, the borrowed character was incorporated into the party as a visitor. The girls constantly animated the four original characters—changing postures, eating, and moving in solidarity with one another. Even when two of the group members were absent, the remaining members animated their characters on behalf of their peers. In contrast, the fifth figure was by characterised by the absence of life and movement. Darles’ character was relegated to the sofa, where she remained idle, visually and spatially marginalised as “other”. Several times during the making of the film, I drew attention to this absence of movement:

Researcher: Make sure the one on the couch moves a bit. [Later]  
 Researcher: Is the purple one going to get some food? Shani: Na  
 – it’s not hungry.

Here, Shani provides a matter-of-fact reason for the inactivity of the visitor, resisting my suggestion to animate the character. The marginalising spatial patterns continued throughout the scene, with the four figurines turning their gaze toward one another as members of their clique or in-group. In contrast, the fifth character was moved to the table only when the other characters had finished eating and were reclining on the sofa. The gaze of the fifth figurine was frequently turned away from the other characters and the camera. She was also the only character ever photographed from back view, which is an angle used to indicate the strongest degree of detachment from the viewers. Wittingly or unwittingly, consciously or uncritically, the group created screen spaces that distanced the non-member from the clique.

This demonstrates how screen spaces are socially constructed sites in which power relations between the created identities of the screen do not escape the culturally constructed power configurations of the world (Valk, 2008). What was being reproduced on the screen were the patterns of exclusion in the girl’s social network or in-group. Representations of the screen

are fundamentally mediated by power relations, which are socially and historically constituted. The girls' symbolic representation of events was not just a matter of symbols corresponding to objective reality, because social relations involving power are always entailed in any representation (Carspecken, 1996). Thus, the girls were implicated in social reproduction of power and relations of domination and subordination, in which all of us participate.

No text – print or screen-based – is value-neutral. Rather than unlocking the “correct meaning” of texts, learners should be encouraged to find multiple readings. All texts represent a particular point of view that may function to silence other voices (Muspratt, Luke, & Freebody, 1997). Without critical engagement of this kind, reading and viewing texts becomes cultural assimilation, bringing one's beliefs into alignment with a corpus of historically valued knowledge. Critical reading and viewing of screen-based texts extends beyond the analysis of linguistic elements (written and spoken words), requiring attention to the spatial, visual, audio, and gestural elements that work harmoniously to create meanings of significance. Through the analysis of multimodal design elements and their dynamic connections, the workings of power represented in the media that students both consume and produce can be illuminated. Such critique is necessary to enable democratic spaces of participation and to encourage the dialogic nature of classroom discourses.

## 8. Conclusion

This article has demonstrated how the use of new technologies and forms of multimodal designing was tied to significant transformations of the classroom space as a social product, including dialogic, bodily, embodied, architectonic, and screen spaces. The social space both mediated and was mediated by the process of claymation movie-making by the participants in an iterative way, creating different potentials for designing.

Collaborative multimodal designing created new “dialogic” spaces of authorship, drawing upon continual interactions between the designers and their multimodal texts (Bakhtin, 1982). The students incorporated their own stories or internal dialogisations of their ideas and experiences into the multi-voiced classroom narrative. This dialogic pedagogy contrasted with lessons involving direct instruction, in which students became passive recipients of the teacher's monologue.

Multimodal designing was tied to the production of specific bodily spaces or “displays of orientation”—participants' uses of gaze, posture, gesture and other modes, suggesting different kinds of engagement with curricular objects and individuals than during periods of direct instruction. Rather than appropriating the limited range of postures that are required when students listen to the teacher, multimodal designing allowed individuals to communicate holistic bodily engagement with simultaneously operating displays of orientation. For example, they negotiated movie designs with their peers, while creating movie sets and props with their hands, providing bodily evidence of their productive designing. Designing multimodal texts created new opportunities for the students to produce identity artefacts that were embodiments of internal acts of meanings, which were similarly shaped by their experiences in multiple socio-cultural contexts. The students drew upon the many layers of representational resources available to them from multiple cultural contexts, projecting social space by reconfiguring their sense of identity through the construction of embodied spaces.

Transformations of the architectonic meanings of the classroom—its material qualities of design and structure, such as spatial arrangements of classroom furniture, were required for students to be inducted into hybrid, specialised filmic production. The new architectonic patterns constituted a different spatial order, functioning as a resource for the students' engagement in creative multimedia production. Filming claymation movies was also mediated by transformations of the timetable, signifying changes to the historically established time-space paths or regionalisation in the school (Giddens, 1984).

An analysis of the students' multimodal products demonstrated the centrality of, and complex relationships between, word and image on the screen. Screen spaces became a site that highlighted how meanings in multimedia are not fixed or additive, but are multiplicative (Lemke, 1998). Secondly, the analysis of screen spaces highlighted the underlying workings of power in the character relations depicted by the students as designers. Screen spaces were found to be socially constructed sites in

which power relations between the created identities of the screen do not escape the culturally constructed power configurations in the children's lives and the wider social system.

Teachers can dynamically transform multiple, socially produced spaces of the classroom through multimodal designing. Teachers can envisage new social spaces, from dialogic spaces for multi-voiced classroom interactions to different bodily and embodied spaces demonstrated by the classroom participants. Similarly, multimodal designing is mediated by transformed architectonic meanings of the immediate built and material space.

In the complex transformation of the students, their designs, and the social space, digital technologies were not seen as an end, but as a means for multimodal designing. Multimodal designing was not about experimenting with novel technologies for an unknown future, or for the sake of innovation itself. Rather, the teachers and students appropriated technologies that already dominate the current global communications environment. New forms of multimodal designing and the transformation of learners called for dynamic transformations of the classroom space, itself, a socially produced multimodal text.

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