Designs in learning and rhizomatic webs

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Introduction

In this chapter we will focus on *designs-in-learning*, that is, those aspects that refer to how individuals (by themselves or in groups) negotiate, make choices, and design their understanding of a phenomenon and of a knowledge area (Selander, 2017; Selander & Kress, 2017). In these processes, they develop their vocabulary, skills, and techniques along different lines. Our focus is on the learner, on how he or she re-designs different multimodal knowledge representations and makes new representations. Here, we are not primarily interested in the curriculum, or the aims and purposes of an exhibition, or questions about effective learning and learning in relation to specific goals. Learning takes place in many different ways, but schools (and museums) are often eager to understand learning through special institutional lenses, that is, those grids and standards by which learning is measured.

Learning can be discussed and analyzed from many different points of view, based on different theoretical positions (Säljö, 2021). Our starting point here is that learning is part of a social practice, and that learning only can be “seen” through multimodal representations—*signs of learning*. However, even if we can see changes over time in different representations, we cannot see *all* the learning that takes place. “What is being learnt?” is thus a very tricky question with many possible answers, depending on the specific interest and theoretical background of the professional teacher or the researcher.

Those traces that individuals leave behind in their different knowledge representations can be a ground for analysis and interpretation—if we have the possibility to compare how they have designed their understanding at different fixing-points. To be able to adequately understand signs of learning, it is necessary to be able to follow learning activities in different sequences over time, something which also is time-consuming and therefore not always possible for, let’s say, a teacher to do in detail. This is not to say that it always will be impossible for teachers to follow the learning that takes place. It depends on how teaching sequences are carried out, and what kinds of knowledge representations are asked for during these sequences. In the future, it might also

be possible to use AI (Artificial Intelligence) solutions to collect and analyze many different kinds of data—but that is beyond the focus of this chapter.

Rhizomatic webs as a metaphor for learning

Learning takes place all the time, and can be understood as an ongoing change and expansion of capabilities to understand different phenomena, and also to act in the world. What we see *as* learning depends on the focus, what we call *cultures of recognition*—that is, what is seen, and understood, as learning in a specific context (Kress & Selander, 2012). Thus, how we see learning differs between let's say a school context and the context of playing a game, even though both activities could lead to deep insights into a phenomenon (Rigby & Ryan, 2011). Learning depends on communication, through the use of symbolic resources such as words, gestures, or pictorial illustrations. Learning could therefore be seen as an aspect of communication (Kress, 2010). On the other hand, we could also say that learning emphasizes other aspects—such as increasing knowledge, capacities, and competencies; things which do not necessarily characterize communication.

Since learning follows different paths, depending on interest and earlier knowledge, as well as on *habitus*,¹ we would like to use the metaphor *rhizomatic learning*. Rhizomatic structures, as in root systems, expand in different ways, but can also be understood as self-regulating systems where information follows different paths. Our nervous systems work like this, depending on intra- and interrelated forces which build patterns. Individual knowledge always develops in a social context, and we build information structures and habits to be able to navigate and act in that context.

It is also the case that the capacity to connect two or more items of data helps us to build systems of symbolic understanding. This capacity seems to be fundamental, and the insights into how this works have even led Chomsky to abandon the idea of built-in linguistic structures in favour of an understanding that the pre-condition to understand and use language is based on the capacity of the brain to combine (any) two or more different elements and thereby build structures (Berwick & Chomsky, 2016). Also, from a philosophical point of view, it has been argued that our capacity to build symbolic forms is fundamental for our species (Cassirer, 1996).

Multimodal knowledge representations

We see the idea of symbolic forms as a figure of thought connected with a multimodal understanding of knowledge representations. We communicate and learn, and we do this by way of semiotic resources like words. Over a very long period of time, the spoken and written “word” has been *the* cultural centre of understanding, of how we learn and communicate (Gadamer, 2002). However, during the last twenty years, social semiotic and multimodally

oriented, linguistically-based research has shown the role of other modes to express knowledge and to communicate, for example, through gestures, intonation, graphic layout, or pictorial illustrations (Kress & van Leeuwen, 2020). In addition, Pippin (2020) discussed how we can express, for example, moral conflicts and standpoints through the medium of film.

These new and different traditions offer both a deeper and a wider understanding of how knowledge can be designed and expressed—what we call *knowledge representations*. In this chapter, we will give an example of how we can follow and understand learning—in film-making. However, before we continue to our example, we would like to introduce a few more theoretical concepts that guide our analysis: epistemological commitments of modes, and re-design by way of transformation and transduction.

Epistemological commitments

Different modes (e.g., image, gesture, speech, writing) operate with different logics in terms of how they afford communication, representation, and meaning-making (cf. Bezemer & Kress, 2008, 2016; Kress, 2003, 2010). In image, for example, spatial composition has a central role for the construal of meaning; a change in composition alters the meaning of the image. Similarly, syntax has a central role for construing meaning in language. Based on the logic of syntax instead of spatial composition, we can alter the meaning of a sentence by changing the order of words. In film, due to its multimodal nature, both composition and syntax, as well as rhythm, are central principles. This has to do with how different modes lend themselves as resources for communication, representation, and meaning-making (see Chapter 3 on affordances by Lindstrand, this volume). Due to their different ways of operating (following the logics referred to above), different modes lend themselves differently to us when used in a meaning-making process. They provide different kinds of access to the world when used in representations. This aspect is what we refer to as the *epistemological commitments* of modes. As Bezemer and Kress (2016) explain:

The units and principles of arrangement that each mode provides offer sign-makers both *potentials* and *limitations*, as well as *prompts* to engage with and so to see the world in certain ways—that is, to see the world through a lens shaped in specific ways.

(p. 31)

Epistemological commitments provide both a certain lens on the world—enabling a certain kind of access to a certain kind of knowledge about a phenomenon—and prompt the meaning-maker to make certain decisions based on the mode used for representing something. Bezemer and Kress (2008) exemplify this aspect by comparing the work to represent something in writing

versus in image. In writing we need to give some information regarding the events and agents in focus in order to compose an intelligible message. An example could be: “two children are watching TV.” If we want to convey a similar message in image we need to make a few more choices, for example: “approximately what ages are they?” “are they standing or sitting?” “with what proximity between them?” and so on. The mode itself prompts a number of decisions to be made.

This is relevant in relation to learning in several important ways. The critical points where decisions need to be made prompt active processes in relation to the topics at hand; the decision-making emphasizes the agency of learners and asserts that their interests influence the process. Furthermore, the decisions made steer the learning process in new directions where new prompts call for new decisions, new possibilities for learning, and so on. This chain of processes points towards the rhizomatic nature of learning mentioned above.

Re-design by way of transformation and transduction

In order to understand the complexity and the potentials of film-making as a vehicle for learning, we also need to mention the notions of re-design, *transformation* and *transduction* (cf. Kress, 2017). All these notions imply changes to semiotic materials but in slightly different ways. Transformation describes changes within a mode—for example when people engaged in fan art continue the stories about characters in popular culture by adding new narratives that expand the original story in some way. It also describes the changes that occur during the work with something—the development from a sketch to a finished painting or from a draft to a finished text of some sort. As Kress (2017) explains:

As transformation operates on and within a mode, the materiality of the mode is not affected. Its semiotic entities and relations of entities are affected, but at a relatively slower rate, and within the ontological frame of the materiality. Consequently, transformation produces epistemological change. (p. 43)

The epistemological changes mentioned in the quotation above point to the relationship with learning. Learning is a transformative process where our understandings of a particular aspect change as we work with them in different ways. Transduction describes the semiotic change that occurs when meaning is “moved,” or interpreted, from one mode to another—for example, in the adaptation of a novel into a film, or when characters from an anime series are interpreted and performed with costumes, wigs, and make-up in cosplay. According to Kress (2017):

In transduction, by contrast, the materiality (and not infrequently, the logic—spatial versus temporal) of the two modes involved—the ‘originary’

and the ‘target’ mode—differ. Given that materiality, entities, process (and at times logics) change, transduction always produces ontological change. In the process of transduction meaning is not transferred, it is newly materialized in the different (material) entities and processes of the ‘recipient mode’; and, where that applies, in the different logic of the recipient mode. In transduction both profound change, and—for want of a better word—‘continuity’ are at issue. A change of materiality or logic or both produces ontological change. Paradoxically, the purpose of transduction is an attempt to preserve ‘core aspects’ of meaning.

(p. 43)

Both notions fit well into a design-oriented approach to learning as they deal with the type of changes that are central to design, re-design, and learning. In relation to film-making, transformation is useful for describing the change in meaning that occurs within each part of the process and for describing the changes in how the teenagers, in our example, reflect upon various things during their work. Transduction is productive in highlighting what the move between different parts of the process actually implies for the film-makers, as each step from one process to the next in fact involves the necessity to transduce meanings into new modes, with new epistemological commitments that open up new perspectives and prompt other decisions to be made.

Making film in schools—a case study

Our example in this chapter stems from a research project that investigated youth collaborative documentary film-making processes as sites for learning, identity work, and social action (Lindstrand, 2006, 2008). The example we will focus on involved six students in upper secondary school. The film-making process was initialized as a school project, introduced by a media educator from a local resource center. The work with film, in the form discussed here, took place over a number of different processes, each characterized by work with different modes, media, and materials. The representations that were communicated in the finished films were processed and articulated in many different forms during the course of the work, before they finally took the shape that reaches the audience. However, since we have limited space and our main intention is to exemplify how the theoretical concepts presented above could be applied to a learning situation, we will focus on only some aspects of the film-making process. We will attend especially to the pre-production parts of the film-making process and focus on how the ideas for the film were framed in different ways.

Searching for a shared interest

The first step in the film-making process is to come up with ideas for the film. As a starting point, some of the group members presented and discussed various

ideas based on their individual experiences and observations of situations they thought could be investigated and addressed critically within the frames of a documentary film. An example of this was the feeling of being unfairly treated in a certain situation. The other group members made associations and contributed their own experiences of similar situations. By looking for the core meaning of the different examples and pinpointing what they had in common, parallel and step-by-step developments of the subject for the film and of the reasoning around the choice of topic were initialized. The process gradually led to a reframing of the topic, from the personal experiences to more general issues in society. Individual accounts of personal experiences of injustice were transformed into a story about social injustice at a societal level. More specifically, the group concluded that they wanted their film to deal with questions about social injustice and welfare issues from a global perspective.

Even though the initial accounts of personal experiences became a starting point for the process and thus set a direction for the work, the process was not linear. The interaction among the students—through the sharing of thoughts, experiences and associations—led to a rhizomatic development of the ideas for the film, from specific individual experiences to questions at a more general societal (and even global) level. The agency and performativity of the students were central to this development as they drove the process through their interaction.

Writing a synopsis

Once the group decided on a topic for their film, a new process began. The rather abstract idea about “social injustice and welfare issues from a global perspective” had to be re-designed and reframed in relation to another medium (pen on paper), another genre (synopsis), and another mode (writing), with other epistemological commitments. In other words, the group was facing the challenge of transducing their idea into a written text that further specified *how* they intended to deal with this issue in the form of representations in film. This prompted the group to search for examples that they saw as possible parts of a multimodal argumentation that corresponded with their intentions, and from situations that were possible to capture on video. The work can be described as a process of making distinctions, where the group identified those aspects that best contributed to conveying their message (cf. Kress, 2003). At the end of this session, the synopsis was articulated in the following way:

Synopsis

With our film, we want to shed light on welfare problems.

The film will show the contrasts between the developed and developing countries. We will address the issues of water, stress, and hunger.

We will start each problem with a humorous angle and then an interview with a person in the street. Each problem will end with a black box stating the situation in the developing countries.

We want to make those who see the film reflect on problems in developed and developing countries. As a viewer, you can also reflect on the problems that welfare brings with it.

What we want to say is: Too much and too little spoils everything!

(Lindstrand, 2006, p. 120, our translation from Swedish)

The process of writing the synopsis involved a reconfiguration of the meanings articulated in the previous process, as the work to transduce the more general idea about “social injustice and welfare issues from a global perspective” led the group to make connections between this overarching topic and the various examples presented in the synopsis above. For example, they specified that social injustice and welfare issues could involve issues related to water, stress, and hunger.

Storyboard

In the third part of the film-making process the agenda was to create a storyboard based on the ideas developed in the previous parts. A storyboard could be described as a visual manuscript with sketched images representing the various shots in terms of what they depict, how the image is composed, and so on (see Figure 2.1). There is also space for including written notes about each shot—for example, describing qualities that are difficult to capture in image, such as actions and sounds. As the shots are represented in a chronological order and they are placed in correspondence with where and when they are planned to appear in the film, the storyboard enables an overview of how the planned narrative and argumentation are structured.

For the group of students, the move towards a storyboard implied yet another change of conditions, as visual aspects were brought to the fore. Their interests, the overarching theme, and the specification of this theme in terms of “water, stress, and hunger”—as well as the other aspects presented in the synopsis—had to be re-designed and reframed again, in relation to yet another genre (storyboard) and another mode (image). Once again, other epistemological commitments called for new aspects for the group to consider. At this point, the task was to construct the narrative for the film visually, piece by piece. The transduction from written synopsis to multimodal storyboard required the group of students to further specify and visualize the still rather vague examples (i.e., water, stress, and hunger). What specific situations could be shown in order to make the point about social injustice in relation to water, stress, and hunger? How should these situations be depicted and how should the depictions be juxtaposed with other materials (shots, informational texts, etc.) to effectively build an argumentation that corresponded with the interests of the filmmakers? And so on.

In their work with hunger, the group decided to present the issue of self-starvation (e.g., anorexia & bulimia) in western cultures in different ways. The

Figure 2.1 Detail from storyboard.

Source: (Lindstrand, 2006, p. 123)

first was to interview staff at a food store about the consumption of diet and low-fat products. The second, with a sequence of shots, presented a series of staged situations where two friends interacted around the issue of self-starvation in different ways. In the first of these sequences, the two friends were out shopping for food and discussing whether to buy low-fat products or not. In the following shot they were sitting at a table and one of them encouraged the other to eat. The final part showed how the person who was presented as anxious about eating made herself throw up in the bathroom. The sequence was followed by two shots with informational text in white on a black background, saying: “while we starve ourselves” and “1.2 billion people starve involuntarily.”

Again, as we saw in the previous examples from the process, the understanding of the issues in focus was transformed as the young filmmakers had to break overarching ideas down into more concrete examples. The understanding of social injustice and welfare issues from a global perspective were reconfigured into specific utterances that elaborated how the problems addressed may appear in everyday situations.

Conclusion

In this chapter we have focused on aspects related to what we referred to as designs-in-learning, emphasizing the role of learners in their learning

processes. In the example from the collaborative film-making endeavor, it is clear the agency of the students was central. They decided what issues they wanted to address in their film, and in doing so they set a direction for their learning process. In our account here, this was most obviously related to the topics and subject areas dealt with by the students, but their decisions also affected their learning trajectories in relation to filmmaking, communication with moving images, and representation more generally (cf. Lindstrand, 2006).

These learning processes, that could be traced by attending to how the topics of their film were transformed, reframed, and transduced in different ways as they moved from one part of the film-making process to the next, were not linear, but evolved rhizomatically. The group started out with open discussions where individual stories about personal experiences prompted associations in others, leading to an accumulation of thematically-related stories. By looking at these stories as a body of material, the group was able to look beyond the personal and to focus on common features at a more general level. Instead of individual experiences of being treated unfairly, the theme of injustice appeared as a more general topic. The group decided to elevate the theme even more by including a global perspective and by adding welfare issues as a domain.

As the process continued, new frames for the group's work were introduced in terms of new genres, new media, and new modes with other epistemological commitments. Step by step, the group had to specify and materialize their ideas in accordance with these frames, spurring the rhizomatic process to continue. Where we left the group in our example, their idea for the film had been transformed and transduced from personal experiences of being treated unfairly to a general theme of social injustice and welfare issues globally, broken down into the subcategories of water, hunger, and stress, and finally rearticulated as images representing everyday situations related to self-starvation (as one of three themes). In these processes, the students worked intensely with making connections and seeing patterns by means of associations, leading to a gradual reconfiguration (re-design) of their understanding of the themes in focus, articulated in multimodal knowledge representations of various kinds—from open discussions to a completed film.

Note

- 1 Habitus is here understood as a social disposition to act and behave in certain ways, depending on the social environment in which it develops. See, for example, Bourdieu (1977, 2010).

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