Teaching and learning are not in themselves new phenomena; they once took place within the routines of daily life. During the early industrialised era, however, these practices came to be increasingly confined to a separate and specialised institution, whose features evolved to encompass, among others, a specific teaching profession, school textbooks aimed at particular stages of the schooling process, weekly teaching schedules and standardised tests.

Industrialisation dismantled what had been viewed as social coherence; the “new” sociologies of Weber, Durkheim and Marx were concerned with attempting to understand the consequences for society of the profound changes in the economy, morality, religion, and in the distribution of social wealth which emerged in industrialisation’s wake. These changes did not pass the field of education by. In Germany, Herbart, and later Nohl and Weniger, tried to formulate a philosophy for a reform-oriented education, while in the US Dewey, followed by Kilpatrick and Counts, tried to address this issue. Their work offers us insights into the tension between principles promulgated by and centred around state, national or federal authorities and progressivist ideas focusing on the individual, as well as that between more general ideas of “Bildung”, education as an aim in and of itself, and concepts of a more specific nature revolving around education for the labour market and for trades and professions.

We now appear to find ourselves facing a new kind of social revolution, whose core manifestation appears in the changes sweeping the world with the advance of globalisation, multimedia and digitised communication, which once again appear to be changing the social structures as well as, among other things, relationships between producers and consumers of information. These changes have profound implications for teaching and learning in schools and for the ways in which we respond to the new challenges they bring. This article will outline a potential multimodal approach to these issues, drawing on design theory.

Changing views on learning

The last 60 years have seen the emergence of a number of different “grand theories” in the field of education, from behaviourism (Skinner) and constructionism (Piaget) to social constructivism (Vygotsky). Each of these theories rests on substantial empirical findings, even though the objects of knowledge they construct are radically different. They also seem to have served to socially legitimise the educational policies of various states, in terms of such issues as the roles of teachers and students and the organisation and testing of curricular content.

Taking a longer view, we can identify three other types of principles on teaching and learning:

• The mimetic principle and the rhetorical tradition in pre-industrialised societies (pre-1850). Learning was organised by way of “doing as others do” and memorising by heart. The rhetorical tradition encapsulated both “good manners” and the skills or art of performing a task, enabling the learner to create something new and individualised.

• The principles of logo-centrism and behaviour control during the industrialised era (1850 – 2000). The former assumed that learning was based above all on literacy, on understanding script and using books. The latter, behaviourism, focused on the control of people’s actions and behaviours, and viewed the learning of content as the result of stimulus-response activities.

• Learning as communication and the multimodal turn during the post-modern era (2000 – present). According to this model, teachers...
and students alike become producers and consumers of information and “designers” of learning activities.

... AND ON THE REPRODUCTION OF SOCIAL EXISTENCE AND ARTEFACTS

When Bourdieu and Passeron (1977) published their key work *Reproduction in Education, Society and Culture*, their idea was essentially that society reproduced itself as “the same”. Today, our view is different; we might say that digital media reproduce “the same” according to logarithms, but humans never re-produce something exactly “the same”, instead creating meaning. The repetition of communicative acts entails the making of new selections, in terms of the precise manifestation of these acts, over and over again. For example, we hold certain festivals every year, and yet we never do quite the same thing twice to mark them. We establish, instead, a new system of resemblance – we “repeat the unrepeatable” (Deleuze, 2001, p. 1). The same applies to teaching and learning activities in schools: we do “the same” with successive classes, but again and again we establish a new system of resemblance.

TOWARDS A NEW PERSPECTIVE ON COMMUNICATION AND LEARNING

A traditional view of communication that appears to have had a great deal of impact in schools is the model proposed by Shannon and Weaver (1948/1998) which aims to describe and understand technical communication. This model is based on the following:

- sender
- context
- message
- contact
- code
- receiver

The underlying assumption is that if the message is clear, if there are no distortions in the channels via which it is transmitted, and if the receiver has adequate knowledge of the relevant code, the message will be understood according to its intended meaning. In the context of the classroom, this implies that the teacher’s primary, perhaps exclusive aim should be to focus on creating a clear message appropriate to the students’ level of knowledge. This model might suffice for specific items of information, but as a metaphor for human communication it is misleading, as has been widely discussed (see, for example, Sheridan and Rowsell 2010). Human communication might be described as relying on the following components (see also Selander and Kress 2010):

- setting
- context/resources
- affordance
- meaning-making
- transformation and redesign
- (new) representation

The communicative setting refers to the environment in which different people engage in different ways, selecting meaningful information to communicate and/or receive. In a specific context, they use a range of resources as appropriate to create meaning. They transform the information and design, or redesign, a representation that will never be the “same” as the original one.
Considering the matter in this light, we might view design as a more adequate concept for talking about teaching and learning activities. In this context, however, “design” does not mean the process of giving form to an already existing idea. Instead, design can be defined as a combination of form and function, with form as an integral part of the message. Design is also seen as a matter of acting with the users of the designed object; examples are interactive design or design for the purpose of organisational change. The concept of design has the potential to enhance our view of learning as a creative act of multiple transformations and re-designs. Finally, the issue of design highlights the question of the existing “culture of recognition” – how we are to evaluate whether progress has taken place and recognise student achievement.

The computer boom in the Swedish classroom

In Sweden, the number of computers increased substantially between 2008 and 2012; during the same period, the proportion of teachers with access to computers rose from 27% to 77% in compulsory schools, and from 77% to 94% in further education colleges and sixth-form institutions. At the same time, the number of pupils per computer in the school system has fallen from 6.1 to 3.1 in compulsory schools and from 2.5 to 1.3 in further education colleges and sixth-form institutions. The figures for private schools show falls from 4.5 to 2.4 and from 1.6 to 1.3 respectively.

The extent and nature of computer use in schools differs from subject to subject of the curriculum. There is greater use of computers during lessons in Swedish (language and literature), social-science subjects and English than in the sciences and mathematics. Of course, these facts do not represent a statement or judgement of any kind on the quality of the teaching and learning activities that take place using computers; if, however, we take a look at what is happening in the classroom, we will be able to observe new patterns of communication and extended use of a range of resources (Kjällander 2011). Let us look at one example concerning the resources used in a history lesson in the third year of schooling (Åkerfeldt et al. 2013):
• The teacher works with a smartboard connected to a laptop. Using Google Earth, he asks the students questions about the architecture of the Pantheon and Colosseum, among others. He also uses social science wikis which he constructed himself and the website Proof (to check pupils’ homework).

• The pupils also work with the following resources: Liber’s net-resource (publisher), SvT-play (Swedish television), tacitus.se (map), and hist.se.

EMERGING PATTERNS
The use of digital technology appears to lead to the emergence of new kinds of teaching and learning activities. In the flipped classroom, with its reversal of the traditional structuring of instruction and application, the teacher digitally records and distributes material for the pupils to work on before the lesson. When the pupils come to school, the teacher organises concept-oriented discussions, laboratory work and other active forms of learning rather than “lecturing”.

Computer games appear to increase pupils’ interest in learning new things and to sharpen their awareness of their own abilities. They feel more in control of the material; computers allow pupils to test things out and work at their own pace in a focused manner. The games challenge them to proceed beyond their current level of competence and increase their options in terms of exploring new situations.

However, “learning by gaming” also calls us to ask critical questions such as:
• Can you drive a real car if you have only learnt to drive a car in a game?
• Is “levelling up” based on the player’s increasing skill levels, or is it just a part of the game whose purpose is to keep users playing?
• Are all participants actually learning – or are some playing and others doing the analysing?

CONCLUSION
This article has – briefly – highlighted changes in communication and learning currently taking place in society and pointed towards new patterns of communication in the classroom in relation to the spread of new technologies. Once merely an add-on, new technologies are now appearing to drive changes in teaching and learning practice. We now find ourselves facing at least three new challenges:
• The development of a new basis for the curriculum, taking these new technologies into account;
• The concomitant need for new cultures of the recognition of achievement and appropriate assessment practices;
• The development of an understanding of the role of digital media in the organisation of school work.

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REFERENCES/FURTHER READING


