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Meaningful Learning with Digital and Online Videos: Theoretical Perspectives

PÄIVI KARPPINEN
University of Lapland
Rovaniemi, Finland
pahakka@luukku.com

In this article theoretical perspectives for analyzing the pedagogical meaningfulness of using videos in teaching, studying, and learning are presented and discussed with a special focus on using digital and online video materials. The theoretical arguments were applied in the international Joint Inserts Bank for Schools (JIBS) project (http://www.ebu.ch/departments/television/co_finance/jibs.php). Out of existing theoretical literature six characteristics of meaningful learning were selected. According to these characteristics, meaningful learning is (a) active, (b) constructive and individual, (c) collaborative and conversational, (d) contextual, (e) guided, and (f) emotionally involving and motivating. In this article, these characteristics are discussed with a special focus on learning with digital and online video materials. The characteristics provide insights into how digital and online videos can be used in a pedagogically meaningful way in teaching, studying, and learning processes. It is evident that videos viewed either through television or computer can be seen as tools for learning. However, videos are just one component in the complexity of a classroom activity system. The learning outcomes depend largely on the way videos are used as part of the overall learning environment, for example, how viewing or producing videos is integrated into other learning resources and tasks.

EDUCATIONAL USE OF DIGITAL AND ONLINE VIDEOS

The moving image has been used quite a long time for educational purposes, starting from the magic lanterns over a century ago to the latest web streaming technologies (Asensio & Young, 2002). It has nevertheless been argued that analogue video lack the interactivity needed for a meaningful learning experience and a number of researchers (Tiffin & Rajasingham, 1995; Asensio & Young, 2002) associate film and video with a classic instructional or transmission pedagogic approach. The research into the educational use of television is abundant, and within this line of research, the views of television as a passive medium are, of course, also challenged by many researchers (Bickham, Wright, & Huston, 2001).

Indepth research into the educational use of online videos and multimedia, on the other hand, is still rather scarce due to the relative infancy of the Internet and the technologies needed to produce, edit and view digital and online videos (Tarpley, 2001, p. 555; Young & Strom, 2002, p. 6; Jonassen 2000, p. 208). Asensio and Young have introduced a conceptual framework called the "Three 'I's Framework" for analysing the benefits and use of video in education. In the framework they describe the interplay of *image, interactivity,* and *integration*. According to Asensio and Young, in the research on the educational use of videos, it has been argued that the value of videos lies mainly in its possibility to deliver images. As the cliché has it, "an image is worth a thousand words." In addition, the modern digital and online videos can be used as an interactive and integrated tool. Online videos can be interlinked with slides, supporting texts, discussion boards, chat, resource links, and so forth, as part of a virtual learning environment. The creation of online and digital video has changed the nature of video itself, and it cannot be treated as a medium in isolation (Asensio & Young, 2002; Young & Strom). Digital and online videos are often embedded in a multimedia or hypermedia environment, and some educators prefer talking about multimedia or hypermedia learning (Boyle, 1997).

The useful conceptual clarification of teaching *about*, *through,* and *with* media has been elaborated upon by David H. Jonassen regarding the use of computers in schools. Jonassen conceptualized computers as cognitive tools (Mindtools), arguing that this represents a major change of thinking about how computers can be and should be used in classrooms. From the computer-assisted instruction (CAI) models of the 1970s and much of the 1980s, which represented learning *from* computers, through the 1980s emphasis on

learning *about* computers, we should now understand learning as learning *with* computers. For Jonassen, the most beneficial way of using computers in classrooms is for accessing information and interpreting, organizing, and representing knowledge (Jonassen, 2000, pp. 1-8).

The learning activities that pupils perform with videos are a crucial part of learning outcomes (see also Boyle, 1997, 178-180). Simply presenting information in a stimulating and interesting digital video format will not automatically lead to indepth learning. Teaching, studying, and learning with videos, whether analogue or digital, should be assessed using the characteristics of meaningful and good learning processes. The value of the tools (e.g., online videos) lies in the ways they are put to use in real life teaching, studying, and learning situations.

CHARACTERISTICS OF MEANINGFUL LEARNING

On a general level, this article builds on a constructivist view of learning. The literature on the principles and characteristics of constructivist learning is abundant (Simons, 1993), not to mention that the term "constructivism" serves as an umbrella term for a wide diversity of views (Duffy & Cunningham, 1996, p. 171). From this large body of research, the arguments of David H. Jonassen (1995, 2002; Jonassen & Rohrer-Murphy, 1999); Heli Ruokamo (2000); Ruokamo, Tella, Vahtivuori, Tuovinen, and Tissari (2002, 2003; Vahtivuori-Hänninen et al., 2004); and Hannu Soini (1999) were selected for producing six characteristics of meaningful learning processes. These researchers agree with the general two principles of constructivism, as defined by Duffy and Cunningham (1996, p. 171): (a) learning is an active process of constructing rather than acquiring knowledge, and (b) instruction is a process of supporting that construction rather than communicating knowledge. The arguments of Hannu Soini (1999) were selected because of his emphasis on the role of emotions in good learning situations.

Out of Jonassen's seven and Ruokamo et al's 11 characteristics of meaningful learning and Soini's six characteristics of good learning situations, six characteristics were selected. This choice does not imply that the remaining characteristics were less meaningful. Instead, the time frame, resources, and accordingly, the research methods of the JIBS research didn't allow for the

analysis of the data with respect to the other characteristics. The characteristics are presented in Table 1. According to these characteristics, meaningful learning is (a) active, (b) constructive and individual, (c) collaborative and conversational, (d) contextual, (e) guided, and (f) emotionally involving and motivating. In the following pages, these characteristics are described with a special focus on learning with digital and online video materials.

Table 1

Characteristics Selected from the Characteristics of Meaningful Learning (Jonassen; Ruokamo; Ruokamo et al.) and Characteristics of Good Learning Situations (Soini)

Characteristics selected	**Jonassen (1995, 2002)**	**Ruokamo (2000), Ruokamo et al. (2002, 2003)**	**Soini (1999)**
1. Active	Active	Active and self-Directed	Autonomy
2. Constructive and individual	Constructive	Constructive and cumulative	-
		Individual	
3. Collaborative and conversational	Collaborative	Cooperative and communal	Collaboration
	Conversational	Conversational and interactive	Dialogue
4. Contextual	Contextualized	Contextual and situational	-
5. Guided	-	Guided	-
6. Emotionally involving and motivating	-	-	Emotionally involving
	Intentional	*Goal-Oriented and purposive*	-
	Reflective	*Reflective*	*Reflection and feedback*
	-	*Transferable*	-
	-	*Abstract*	-
	-	-	*Possibility to see things from new or different perspectives*

Active

Within the constructivist views on learning, it is widely agreed that students learn best if they take an active role in their own learning (Duffy & Cunningham, 1996, p. 171). For Jonassen (1995), active learning meant that "learners are engaged by the learning process in a mindful processing of information, where they are responsible for the result" (p. 60). This means that

pupils are in the roles of active learners, encouraged to ask questions, acquire information, critically evaluate information, and express new ideas and models of thinking (Ruokamo et al., 2002, p. 1678). In addition, pupils are able to use different productivity tools and cognitive tools (e.g., videos) actively in their learning environments (Jonassen, 1995, p. 63; 2000).

Many educators and researchers have argued for giving pupils possibilities to produce videos themselves, especially within the subject of Media Studies (Burn, 2002a; Sintonen, 2001, p. 90). Several benefits for the learning process have been identified, such as the pupils' enhanced motivation and engagement with the subject matter (Asensio & Young, 2002, p. 17; Reid, Burn, & Parker, 2002, p. 6; Jonassen 2000, p. 228; Burn 2002b, p. 42), improved moving image literacy (Reid, Burn, & Parker, 2002, p. 9), enhanced media skills and critical view of media (Adams & Hamm, 2000, p. 34-35). Also cited as learning benefits are the chances for pupils to reflect on themselves and their behaviour (Reid, Burn, & Parker, 2002, p. 6), more creative possibilities for expression (Jonassen, 2000, p. 228; Burn 2002b, p. 42), the developing of technical skills and the creating of curriculum resources (Fawkes, 1999, p. 92). In addition, making videos has been reported to be an opportunity for boosting the self-esteem of the pupils (Fawkes, p. 92) as well as motivating and activating also the previously underachieving pupils (Burn, 2002b, p. 42).

Digital videos, as opposed to analogue ones, have been strongly argued for as offering pupils opportunities for an interactive learning process (Boyle, 1997, pp. 178-180; Marchionini, 2003; Asensio & Young, 2002, p. 10). Interactive multimedia resources can allow pupils to direct their own pace of learning, input their own views and ideas, interact with other learners across the globe, revisit learning points easily, and create their own multimedia notebook for future use (Cogill, 1999, pp. 99-100). According to Tom Boyle, digital videos should not be treated as a "procedural" resource, which runs along a set path. Instead, they should be treated as far as possible as a "declarative" resource, which can be entered at a number of points and traversed in a number of ways. Accordingly, the user should be given control over the video (Boyle, 1997, pp. 179-180).

Constructive and Individual

Constructive learning means that learners accommodate new ideas into their prior knowledge. This process of constructing knowledge is a process of meaning-making, not of knowledge-reception. The meaning-making process results from puzzlement, perturbation, expectation violations, curiosity, or cognitive dissonance. In other words, it is a process of making sense of the world around us (Jonassen, 1995, p. 60; 2002, p. 45).

Ruokamo et al. (2002, p. 1679; Vahtivuori-Hänninen et al., 2004) include individuality as one component of their 11 characteristics of meaningful learning. By individuality, they mean first of all, that learners have individual learning styles and strategies and secondly, that learning and studying are always influenced by students' prior knowledge, conceptions, and interests.

The argument of different learning styles has been delineated by many educators to put forth the axiom that learning environments should be designed so as to allow different types of learning styles to flourish (Meadows & Leask, 2000). However, the concept of learning style has been used to refer to very different things. One of the popular conceptualizations has been Reid's identification of four particular forms of learning: (a) visual, (b) auditory, (c) kinaesthetic, and (d) tactile (hands-on learning) (Meadows & Leask, p. 7-10). Accordingly, the use of audiovisual material has been argued to support visual and auditory learning styles. Very often, however, the use of audiovisual material has been claimed to cater to a broad array of learning styles, and to be thus beneficial for the learning process without further specifying what is meant by a learning style (Reed, 2003). It appears as though the concept of a learning style has become a sort of slogan to be used when discussing audiovisual material in teaching and learning contexts.

Another issue related to the concept of a learning style is a student's preference for a representational system (verbal or visual). According to Hannelore M. Dekeyser (2000), one strongly advised method for educators and educational designers has been to obtain congruence between the learner's "style" (i.e., preference for representational system) and the characteristics of the learning material. However, researchers have started to question this common advice. Dekeyser argued further, that some support has been given by research that this subjective preference is also

related to a more successful use of the preferred mode. (Dekeyser, p. 99-100).

However, guiding pupils only to further enhance their strengths is not a valid educational strategy, and this pedagogical argument has been highlighted also by Ari Alamäki and Jussi Luukkonen (pp. 96-97). Alamäki and Luukkonen argued that in effective learning processes, multiple methods, and materials are used. In addition, most people use a number of learning styles, only with different emphasis, and very few people can be said to represent purely one type of learning style. Alamäki and Luukkonen drew attention also to the fact that the use of a certain learning style may be highly situation specific, which makes the phenomenon still more complex. (Alamäki & Luukkonen, pp. 96-97).

Dekeyser (2000, pp. 100-101) introduced three more arguments that challenge the recommendation for congruence between learning materials and the style of the learner. According to the pragmatic argument, different learning contents demand different representational modes, and therefore students need to be fluent in handling different representational systems. By the constructive friction argument, Dekeyser meant that incongruence between the style of the learner and the learning material does not necessarily have negative results, but on the contrary, it can offer students a challenge to increase learning and thinking capabilities and motivate students for change. As the third argument, Dekeyser introduced the "Benefit from Multiple Representations" argument, according to which, under specific conditions, presenting the same information by means of multiple representations is effective for learning. However, it has to be emphasized that all of the previously mentioned arguments must be seen as possibilities that can be realized under specific conditions. As Dekeyser puts it, "The main question therefore is not 'whether' but 'when'...."

What can be summarized is that, incongruence between a student's learning style and the learning materials is not necessarily a hindrance to learning. In addition, presenting multiple representations is not necessarily beneficial. Jonassen (2000, p. 208) summarized the results of the multiple-channel research on learning effects from the past as follows: (a) when the channels provide complementary information, learning may increase (b) when the information in different channels is redundant, no improvement occurs, and (c) when the information in different channels is inconsistent or distracting, learning decreases. However, Jonassen emphasized the lack of current

research on learning effects from multimedia and called for verification of these findings with current multimedia products.

Collaborative and Conversational

Working in learning and knowledge building communities makes it possible for pupils to exploit each other's skills and provide social support and modeling for other pupils (Jonassen, 1995, p. 60). This view is shared by contemporary social constructivist learning theories focusing increasingly on the social nature of learning, which is often conceptualized as a meaning-making process. According to this view, learning is dialogue, that is, a process of internal or social negotiation. Many things can function as a starting point for this negotiation: a puzzlement, perturbation, expectation violation, curiosity, or cognitive dissonance (Jonassen, 2002, pp. 45-46). The importance of discussion and dialogue in the social constructivist framework originates in the rediscovery of Vygotsky's (1978) views of cognitive development (Knuth & Cunningham, 1992, pp. 171-172).

There is a good deal of research evidence to support the fact that interacting around the computer can be a very productive way of learning (Light & Littleton, 1999). The same can be true for interacting around videos, whether analogue or digital. A pedagogically meaningful use of videos is one in which the learner resorts to collaboration and conversation. Moving images have been, by their nature, frequently commented by teachers as being able to generate a rich classroom discussion (British Film Institute Primary Education Working Group, 2003, p. 14).

However, simply putting pupils around a computer to work together will not automatically result in a pedagogically meaningful collaborative construction of knowledge. In every collaborative situation, a dynamic interaction of social and emotional aspects is simultaneously taking place. As Dawes, Mercer, and Wegerif (2000, p. 40) pointed out: "Communication happens between people, and it is not about uploading and downloading bytes of information—it is about reaching a shared understanding." The quality of the talk around computers depends largely on how the teacher organizes the activity, for example, how he/she organizes the children into effective groups (Dawes et al., pp. 41-43) and how he/she guides the process. At its best, collaborative work provides pupils with opportunities for a positive

sense of social inclusion, which can be seen as an important component of personality development and motivation to learn (Wosnitza & Nenniger, 2001, p. 177). Nevertheless, collaborative work can also further the feeling of being rejected by the class, if the collaborative situations are not appropriately organized and guided by the teacher.

Contextual

Constructivist educators have stressed the need to situate (e.g. Brown, Collins, & Duguid) or anchor (Cognition and Technology Group at Vanderbilt) learning in authentic, relevant, and/or realistic contexts (Duffy & Cunningham, 1996, p. 179). In accordance with this line of thinking, Jonassen saw contextual learning as that which resorts to learning tasks that are either situated in meaningful real-world tasks or simulated through a case-based or problem-based learning environment. One of the roles of technology in meaningful learning should accordingly function as a mind-tool, which functions, for example, by:

- representing and simulating meaningful real-world situations, problems or contexts;
- representing the beliefs, perspectives and stories of others; and
- supporting discourse among pupils. (Jonassen, 1995, pp. 61-62; 2000, pp. 8-9).

The potential of video for providing the context, or a starting point, for learning has been promoted by many educators and researchers. The Cognition and Technology Group at Vanderbilt ([CTGV], 1991, 1993) has stressed the meaning of video materials for generative learning environments, i.e. environments that include an emphasis on in-context learning organized around authentic tasks, often involving group discussions. The theoretical framework behind the work of CTGV emphasizes the importance of anchoring or situating instruction in meaningful, problem-solving contexts. These anchors illustrate problem-solving situations for pupils and therefore function as important tools for learning problem solving.

Duffy and Cunningham (1996, p. 187) have pointed out the impact of video technology on our understanding of dynamic events. For language learners, video offers the possibility to witness the dynamics of interaction, that is, native speakers using different accents and paralinguistic cues (White, Easton, & Anderson, 2000, p. 168).

One of the educational benefits of videos lies in their ability to depict places, situations, people, and so forth, that would otherwise be very hard or impossible for pupils to visit and encounter (Cogill, 1999, p. 98). This benefit has been recognized from the early days of educational television, and currently, a growing number of multimedia resources are being produced to show pupils places etc. otherwise impossible to visit (Mak, 1997; Mostert, 2002). In addition to helping to transcend physical boundaries, the value of video material in transcending chronological boundaries is, of course, obvious, and video materials of historical sites and dramatizations provide insight into events of the historical world (Cogill).

Guided

The concept of guidance is, within the social constructivist perspective, understood with the help of Vygotsky's (1978) views on the zone of proximal development:

> The distance between the actual developmental level of a child as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (p. 86).

Duffy and Cunningham (1996) have broadened upon this concept of progressively withdrawn tutor or teacher support. Rather than talking about what is done to an individual learner, they prefer to talk about the affordances of the environment. They stress the need to look more broadly at the environment to determine how the environment is designed: is it supportive of the individual in relation to the learning task? This way, the focus is shifting from what is taught to how a learning environment is designed. Success in the zone of proximal development requires support, a type of scaffolding, for learning. Scaffolding includes support from other individuals, any artefacts in the environment that afford support and the cultural

context and history that these individuals bring to the learning situation. (pp. 183-184).

Anderson, Rourke, Garrison, and Archer (2001) have proposed the term teaching presence, by which they mean "the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes." They maintain that only through the active intervention of a teacher, cooperative learning becomes a meaningful instructional and learning resource. They describe teaching presence with the help of three different categories:

- design and organization (e.g., designing methods, utilizing media effectively);
- facilitating discourse (e.g., encouraging student contributions, setting the climate for learning, drawing in participants);
- direct instruction (e.g., presenting content/questions, diagnosing misconceptions).

Anderson et al.'s concept of teaching presence makes explicit the sort of activities that can be understood as teacher presence. The concept of guidance can thus take a broad view of the guiding activities, taking into consideration also the designing activities of the teacher. For the design and organization of learning activities with video material, the teacher has to consider several important planning issues (see also Fawkes, 1999): What preparation will the class need? What kind of interaction do we need? What kind of questions will I myself ask? What kind of learning tasks will I combine with the viewing of the video?

Emotionally Involving and Motivating

A growing number of researchers, especially educational psychologists, have argued that emotion is intertwined with cognition, motivation, and learning and should therefore be studied more systematically in classroom contexts (Meyer & Turner, 2002; Op't Eynde, De Corte, & Verschaffel, 2001; Soini, 1999; Järvelä & Niemivirta, 2001, p. 108; Volet, 2001; Schutz

& DeCuir, 2002). Despite this growing body of research, teachers' and researchers' understanding of the dynamics of students' perceptions, emotions and engagement in learning situations remains, in Simone Volet's (2001) words, "fragmented and speculative" (p. 323), and according to Paul A. Schutz and Jessica T. DeCuir "researchers are just beginning to understand the transactions among emotion, motivation, learning, and self-regulation" (p. 125).

The effect of pupils' emotions on their learning outcomes is highly subjective. Facing difficulties at an early stage of a problem-solving task may result in hopelessness in one student, whereas another student may feel only a bit annoyed and experience the difficulties mainly as a challenge. (Op't Eynde et al., 2001, pp. 160-162). Therefore, it cannot be argued that experiencing difficulties and negative feelings during some stage of the learning process are necessarily a hindrance for learning.

Hannu Soini (1999) has examined the way Finnish and Canadian 1st and 4th year education students had experienced critical learning incidents. The students wrote short narratives about their "real" learning experiences, describing why certain situations were conducive to good learning. Soini produced six qualitatively different categories from the students' narratives:

1. Emotional involvement
2. Reflection and feedback
3. The possibility to see things from different perspectives
4. Autonomy
5. Collaboration
6. Dialogue.

Emotional involvement in the learning process was the feature of favourable learning situations most frequently cited by the education students. According to the students, this involvement emerged from "feelings of personal, emotional connectedness to some subject" (p. 84).

The emotional involvement can thus result from personal connectedness to the subject under study, but it can also be related to the medium with which the subject is studied. The power of videos, whether analogue or digital, to provide a high level of interest and enjoyment in pupils has been demonstrated by a large number of researchers and educators (White et al., 2000). Jonassen (2000) argued that this interest in pupils is mainly due to the multimodality of the videos, that is, they simulate more than one sensory stimulus at a time. (p. 208).

The potential of television and videos to spur affective growth has been advocated by numerous researchers (Ryan, Serdyukov, Russell, & Black, 2002, p. 1694; Dorr, 1985, pp. 69-76). According to Aimée Dorr (cf.) television can present children numerous opportunities for learning about emotions, and thus contribute to the affective development and socialization of children and youth in at least four ways:

- experiencing many emotions during television viewing;
- experiencing the pleasure, relaxation and joy associated with entertainment;
- learning about emotions, including likely situations, labels and display rules for emotions; and
- interpreting emotions from the cues provided in the programs (behavioral, verbal, nonverbal, contextual, etc.).

The ability of television, video recordings, and motion pictures to tell a story in a powerful and emotionally involving way has been highlighted by many educators (e.g., Adams & Hamm, 2000, p. 33). Several educators have stressed that narratives are one of the purposes that videos and digital learning material can and should be used for (Crocker & Fendt, 1998; Alamäki & Luukkonen, 2002, p. 92, pp. 133-134).

CONCLUDING REMARKS

Applying these characteristics in assessing a teaching and learning process does not mean that all of them should be met simultaneously all the time. If

one of more of them fail to occur, learning can still be meaningful and constructive (Simons, 1993, p. 292). These characteristics provide insights into how video material, especially digital and online videos, can be used in a pedagogically meaningful way in teaching, studying, and learning processes. It is evident that videos viewed either through television or computer can be seen as tools for learning. However, videos are just one component in the complexity of a classroom activity system. The learning outcomes depend largely on the way videos are used as part of the overall learning environment, for example, how viewing or producing videos is integrated into other learning resources and tasks.

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