

Comparative Study on Use of Mobile Videos in Elementary and Middle School

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Abstract: Digital media is increasingly finding its way into the discussions of the classroom. The interest lies particularly in mobile learning. Mobile learning means simply learning and teaching practices done with or via different mobile devices. Learning with the help of mobile devices is increasing and it is considered to be one of the 21st century skills children should adapt already in early stages in schools. The article presents a study on mobile social video application, MoViE, as a part of teaching in biology and geography in 8th and 9th grades and in teaching of water consumption and recycling in 5th grade. The multidisciplinary data was processed to answer the following question: Did the use of mobile videos promote learning? Overall the study is based on comparative research since it studies whether there are differences in results between the students in elementary and middle school? It sets out to investigate group's technical competence, learning experiences and attitudes towards mobile learning in general. As a result, the differences between the cases were minor. On the contrary, both of the groups, elementary and middle school students, experienced similar technical difficulties and often shared convergent opinions on new mobile learning methods.

Keywords: Mobile learning, mobile social media, MoViE video sharing application, SEA framework

I. Introduction

During the past decade rapid developments have occurred in the scope, uses and convergence of mobile hand-held computing, communications and information devices and services. Texting and photographing with mobile phones are common practices (notably among young people) across diverse social and economic groups in countries worldwide [1]. This is one of the reasons why mobile learning has a solid ground especially in Europe, since the European market for mobile phones has exceeded 100% penetration - increasing from 84% of the EU population in 2004 to 119% in 2009. The penetration rates in the US and Japan are around 80%. [2] Most new mobile phones have a digital camera and video recorder. This gives a good starting point for a study on mobile learning, which both exploits the mobile Internet as well as mobile phones as video cameras. In a literature review on learning with mobile technologies, Laura Naismith and colleagues (2004) have identified current trends in mobile

computing as being toward devices that are more and more embedded in our everyday routines, ubiquitous and networked. [3] This type of convergence can now be seen in the increasing use of mobile tools in learning. The portability of mobile devices and their ability to connect to the Internet almost anywhere makes them ideal as a store of reference materials and learning experiences as well as general-use tools for fieldwork, where they can be used to record observations via voice, text or multimedia and access reference sources in real time. [4]

According to Mwanza-Simwami (2007) the learning with mobile devices is still a new research area and more work is needed in order to understand the benefits and effects of using technology to support learning. [5] From this point of view it is justified to discuss the characteristics of learning with technology and to build theoretical concepts and frameworks for supporting the design and implementation of pedagogically meaningful applications for learning. In mobile learning, learners can be continually on the move [6]. Learners are not just moving from one place to another but they also move from one context to another and from one technology to another. Based on Sharples, Taylor and Vavoula (2005) some aspects of informal and workplace learning are fundamentally mobile even without mobile learning technologies as such. [7] It is widely accepted that mobile learning should be learner, knowledge, assessment and community -centered [6]. These elements of effective learning suggest a close relation to social media that is clearly user, knowledge and community centered.

Mobile learning can also be described as multimodal learning. Multimodal learning refers to learning process, where learner utilizes two or more different modalities i.e. means of communication during the process [8]. Multimodal learning environments clearly support learning because learners have different ways of learning (visual, auditory, kinesthetic). Adapting to their personal learning styles improve learning. It can be said that learning applications that are based on social media and video are multimodal. Clearly, social media applications support users in creating content, annotating content with tags, evaluating content, and creating social networks with other users sharing similar interests [9]. In social media, users are seen both content consumers and

producers. This study presents concrete results of integrating mobile social media and use of mobile videos into learning practices. The rationale in documenting best practices is making the knowledge gained explicit, as it can provide a pre-understanding for others. [10]

II. Related Work, Methods and Frameworks

The field of mobile learning is recently quite diversely studied. However, the previous research can mainly be divided into larger explorations on mobile learning processes [11; 12; 13] and on research on merely technical solutions. [14; 15; 16] Many published results in the field of mobile learning focus on isolated technology solutions or a specific trial rather than to reflect on the overall work practice and development process of whole initiative. [10] For example, Henry and Suresh (2010) have recently studied the use of intelligent agent based on mobile learning system. In their study they concentrated on the intelligent agent, replicating the tutor, in the m-learning domain. [17] However, in our studies the teacher plays more traditionally role of the tutor and guide since the aim of our study is not e.g. distance learning but more on the use of mobile learning as a part of traditional learning practices. For our study, in general, the research done in order to capture the wider aspects of m-learning are in more value. For example Jeanne Lam's et al. (2010) study attempts to review the evolution of m-learning and to find out the learning trends and readiness of using mobile technologies within the community so that some practices could be encouraged to enhance learning experience. [18] Also the study of Wingkvists and Ericssons (2010) focuses on the practical side of mobile learning and its most acknowledgeable features. Their study analyses and reflects on three mobile learning initiatives with respect to how these address technology, context and stakeholders. [10] Kim (2011) has studied mobile video blogging, and addresses especially underperforming students. Kim studied various mobile video recording approaches and found a correlation between certain blogging strategies and higher learning outcomes. In general, Kim (2011) found the mobile video blogging community "to be a viable learning support model for children in underserved communities". [19]

In this study, the SEA framework [20] is used for designing learning activities in the classroom. The model is based on Activity Theory (AT) and Experiential Learning Theory (ELT). Activity Theory is based on the Vygotsky's cultural-historical psychology ([21]; [22]; [23]; [24]) and it focuses on understanding the human activity and work practices [25]. Experiential Learning Theory describes the learning process with concepts we believe supports learning with social media. Felt experience is one's interpretation of the experience [26]. The use of technology as a means to share our experiences to our family, friends or communities is called a shared felt experience. In this case, the role of the technology is to mediate the experience to the learning community. Technology is mediating our learning experiences to others while being an experience in and of itself. Based on Kolb (1984) the experiential learning theory defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge

results from the combination of grasping and transforming experience [27].

Experiential learning theory (ELT)

Based on Dewey (1938) an experience is characterized by two principles, which are continuity and interaction. By continuity Dewey means a relation between experiences in such a way that every experience a person has will influence her future experiences. Interaction refers to the current situation and its influence on one's experience. In this sense, the interaction means interaction between the person and her surroundings (people, artefacts, processes). Finally, the experience affects to the mind and continuum of experiences. [28] In some cases this can be described as learning. However, not all experiences support learning. Felt experience is one's interpretation of the experience [26], for example I can express my experience by telling about it, drawing, taking a photo etc. The use of technology as a means to share our experiences with our family, friends or communities is called a shared felt experience.

According to McCarty and Wright (2004), interacting with technology involves us emotionally, intellectually, and physically. [26] In the case of social media, the interaction with technology is related, for example, to sharing learning experiences with technology. In this case, the role of the technology is to mediate the experience to the learning community. Technology is mediating our learning experiences to others while being an experience in and of itself. Based on Kolb, the experiential learning theory defines learning as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" [27].

Experiential Learning Theory presents the learning process as a circle (see Figure 1). The process can be divided into four stages: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). The learning process can start at any stage. In between the learning stages there are four learning styles. The learning style is represented by combining learning abilities from the circle with a specific learning style and it is based on both research and clinical observation of the patterns of Kolb's Learning Style Inventory scores [29]. According to Coffield, Moseley, Hall and Ecclestone (2004), a diverging learning style emphasizes concrete experience and reflective observation. [30] It is also imaginative and aware of meanings and values, it views concrete situations from many perspectives and adapts by observation rather than by action. A diverging style can also be described as being feeling-oriented. Assimilating a learning style emphasizes reflective observations and abstract conceptualization. Understanding a wide range of information and putting it into a concise, logical form is natural for people with this learning style [29]. A converging learning style is a combination of abstract conceptualization and active experimentation. Based on Kolb et al. (2001), people with a converging learning style are best at finding practical uses for ideas and theories. [29] An accommodating learning style emphasizes active experimentation and concrete experience. In this style, hands-on experiences and acting based on feelings rather than on logical analysis, is dominant [29].

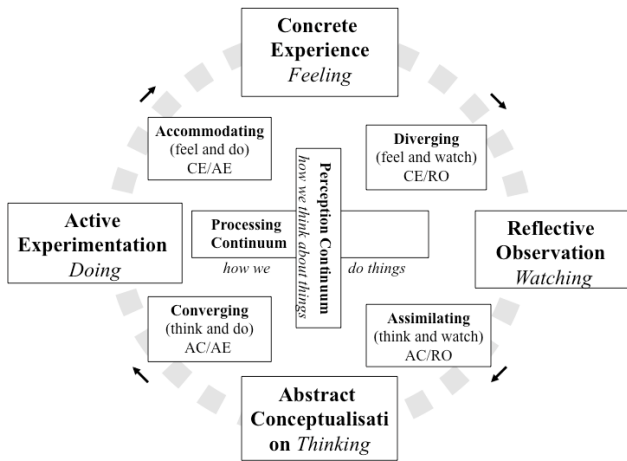


Figure 1: The Experiential Learning Theory (Kolb, 1984)

In the Experiential Learning Theory, learning: “is a process involving the resolution of dialectical conflicts between opposing modes of dealing with the world (ie action and reflection, concreteness and abstraction)” [30]. The learning styles people adapt may change over time and may also depend on the learning context. Webb (1980) stated that not all four stages are needed for learning to take place. We suggest, that in social media based mobile learning environments learning happens in between every stage in ELT model. [31]

Activity theory and SEA framework

Activity Theory is based on Vygotsky’s cultural-historical psychology ([22]; [23]; [21]; [24]) and it focuses on understanding human activity and work practices [25]. The Activity Theory has been applied to many areas: learning from digital games [24], interactive design [21], mobile learning [25], and designing constructivist learning environments [32]. Yardi and Bruckman (2011) used AT to describe the social and technical challenges in parenting teens’ social media use. [33] In this study, Activity Theory is used as a framework for social media based mobile learning environments.

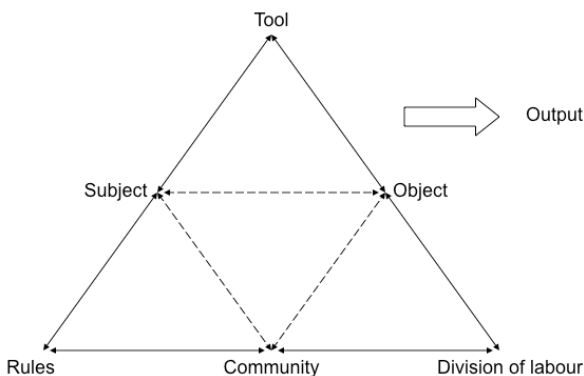


Figure 2. Engeström’s view of the Activity Theory describing activity as a collective phenomenon (Engeström, 1987; Engeström et al., 1999)

In Activity Theory (AT) all human actions are called activities. An activity involves an object that is to be transferred to the output of the activity. A subject performs an

activity using a tool that can be a physical tool or an abstract tool, such as computer software. The tool mediates the activity between the subject and the object. The interactions between subject, object and community can all be mediated (see Figure 2).

Engeström extended the original AT by adding community to the model. Rules mediate the activity between the community and a subject. The activity may be collaborative, i.e. several subjects jointly do the activity using tools and dividing the work between each subject. The object can be, for example, a problem to be solved. In general, tools, rules and division of work mediate the relationship between the subject, community and object. Tools, rules and division of work are artifacts that are used to achieve the outcome. Artifacts are not necessarily a fixed set of tools or things, but they can evolve over time ([23]; [21]). Activities take place in a specific context that is characterized by a network of different parameters or elements that influence one another ([22]; [25]). Activity can furthermore be divided into actions and an action on operations. In general, activities are based on high-level goals (for example, documenting a work process with images and video clips). Activities involve more practical goals, (using a mobile phone to record a video), and operations are routine or automatic (launching a video application, pressing a record button). In this case, rules would be described as being the procedure of doing the documentation.

The Shared Activities and Experiences (SEA) framework originates from a need to describe sharing and experiences in social media in theoretical terms [20]. It is based on the Activity Theory, Mobile Web 2.0 Ecosystem [34], and the idea of considering the shared felt experience as a central design rule. The SEA framework has been used in designing user experiences and user activities for mobile social media services ([20]; [35]). In the SEA framework, there are two modified AT model triangles representing two separate users (see Figure 3). This is to emphasize that users are going to share their learning experiences with other users. Each user may have different tools and objects in her activity system. A tool in our experiment is the mobile device the learner uses along with the MoViE system. Subjects share the community, rules and division of labour. In our experiment the community is the classroom and the teacher, who have access to MoViE. The rules include the both the technical guidance of the MoViE system and the information teacher has given for the learning activity.

In the Activity Theory, an important issue is the contradictions that can occur in the system. Solving the contradictions eventually leads to learning. In the SEA framework, the contradiction is replaced by a more general expression, namely the point of inspiration (or experience). The point of inspiration provides the subject with the initiation of an activity. In learning applications, experiences and contradictions are contradiction points of inspiration. A point of inspiration can also be a motivational factor—the learner is motivated to create a video and show it to other students. In addition, a point of inspiration may also be the possibility of remixing videos recorded by others.

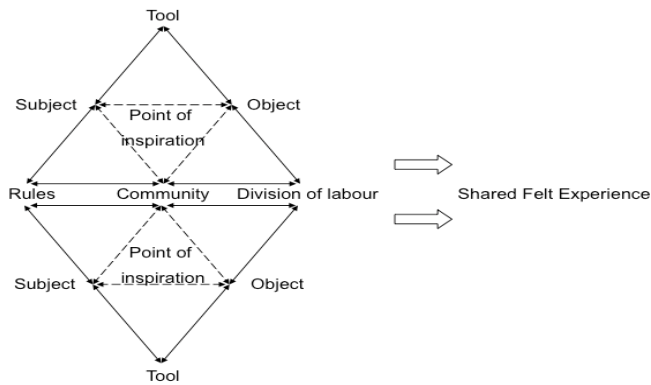


Figure 3: The Shared Experience and Activities (SEA) framework

III. Background of Study

MoViE – Mobile social Video Application

Although video sharing in web is a new tool for learning, most video sharing services are not designed to be used as learning applications. In addition, most of these systems are designed to be used via a computer and with a web browser. Our solution, MoViE (Mobile Video Experience), is designed to be used in learning applications especially with mobile devices. MoViE is a social media service that enables users to create video stories using their mobile devices. In general, MoViE is developed in Tampere University of technology as a research platform for studying how people can create stories, share and learn with mobile social media service. [36] MoViE supports private group creating, user-generated tags, tag spaces, geotags, remixing of clips and moderation. The remixing of mobile videos is one of the reasons why MoViE differs for example from YouTube or other public video services and why we chose MoViE, and why it was developed in the first place – there are not sufficient video sharing services available on the market for learning purposes. The MoViE is developed to address the collaborative and creative demands of learning and it enables several novel ways to utilize videos in educational purposes. [35]

MoViE was designed as a mobile video blogging research instrument and provides a means of creating remixes of videos in the [37]. The appearance of MoViE (see Figure 4) is due to a desire to make it suitable for as many mobile phones as possible without the need of customization. The first screenshot shows the usual activities of a video-sharing site in MoViE. Users may upload videos, watch videos, rate videos and reply to a video with their own video. Something not that common is the possibility of users to make remixes from all of the videos in MoViE. Users can select the videos for remix by hand (left screenshot) or give search words for MoViE to select suitable videos (middle screenshot). Before finalizing the remix user may do some editing, like changing the start

and end points of the video clips or changing the order of the clips (right screenshot).

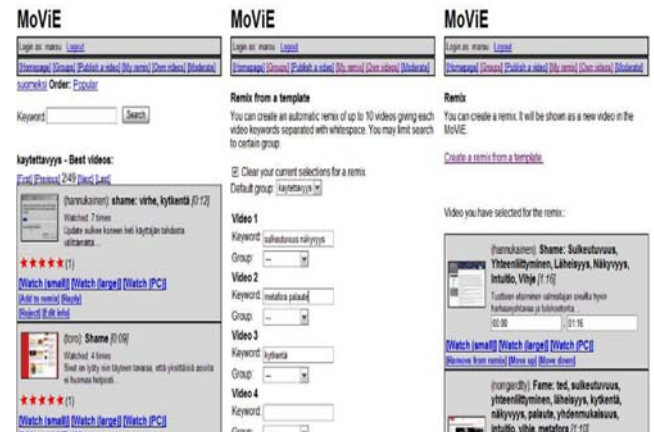


Figure 4: Three screenshots from MoViE

The Pilot Cases and Research Material

The both pilot studies were executed in order to study educational mobile video blogging. The first pilot study and testing was conducted in fall 2009 at the school of Kasavuori in Finland. The wider results of this study in which MoViE was used to teach biology and cultural geography to approximately 90 students have been reported in the Journal of Digital Culture and Education 2/2 2010. [38] However, these results in this article are used in this study in order to enable comparative study among students in different ages. The biology courses dealt with evolution and polymorphism of living organisms. The 9th graders took a course in cultural geography where they did a research on their place of residence, Kauniainen [38].

The second pilot was executed in Espoo and Vantaa in several elementary (classes 1-6) schools. 49 5th graders participated. MoViE was used as a part of larger tryout called Techno Route, more precisely Water Route. The Water route is an educational method/environment that is based on inquiry learning. Inquiry-based learning is a research-based strategy that actively involves students in the exploration of the content, issues, and questions surrounding a curricular area or concept. It involves the learner and leading him to understand. Inquiry here implies on the possessing skills and attitude of yours, which allows you to ask questions about new resolutions and issues while you are gaining new information. Like inquiry learning in general, the Water route encourages students to learn independently (teacher is seen as more of a guide) the mystery of water, its consumption, recycling and hydro-electric power in general. MoViE was used to collect and edit data as well as it was used as a communicational tool between the students.

After the MoViE based courses an Internet inquiry was executed. The Internet inquiry contained approximately 40 questions related to MoViE and its usage, learning experiences and attitudes towards mobile learning. Also according to Liaw et al., (2010) with respect to wide application possibilities of mobile learning, investigating learners' acceptance towards it is an essential issue. [13] Most of the questions were multiple-choice questions (based on the Likert scale 1-5) but the questionnaire also consisted of open questions. These open parts enabled respondents to speak freely on the topic and a chance to comment the questions. Approximately half of the students (n = 50) of 8th and 9th graders answered the survey. 23 were female and 27 male, the average age was 14,4 years. In the second case all of the 5th grader (n=49) students answered the internet inquiry. 25 were female and 24 male, the average age was 11 years. The data from the Internet inquiry and the mobile videos uploaded by the students were analyzed through qualitative content analyzes framework. The research material then consists of student's survey data and the content of the uploaded mobile videos. One of the aims of this study was to gather data that would give a coherent view on the matter.

IV. Results

Observations on the Mobile Video Content

The 8th grade did in 2-3 person groups a short documentary on evolution. They learnt the subject with the help of ordinary textbook and the Internet. Next they did manuscripts of the documents and filmed them. Final videos were watched together in classes and also a written test on evaluation was carried out. Video clips were evaluated (both on the working procedures and the content) and discussed with the students. The 9th graders took a course in cultural geography where they did a research on their place of residence, Kauniainen. The students worked in pairs. They planned and did the research according to their own plans. Research themes were for example services, educational possibilities and traffic/public transportation in Kauniainen. Students were able to choose whether they took videos on the actual implementation of the research (especially when done outside the school premises) or making a short video of the results. The videos were watched together as a part of the oral presentation and they were evaluated [38]. The 5th graders followed the different phases on Water route. They visited for example water treatment plant and while these visits they gathered information around their subject of study. The groups of 2-3 decided their own research questions and then approached it by using mobile videos to gather the bigger picture. At the end all of the groups made a Final splash which included a summary of what the students had learn about water and its recycle.

In ELT, the learning process can be divided in four stages: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE). And in-between the learning stages there are four learning styles: assimilating, diverging, converging and accommodating learning. [29] All of these styles were found through qualitative content analyze on the data created by the

both case's students. The design of the first activity in terms of SEA and ELT is presented on the Table 1.

Table 1: A learning activity designed using SEA

Activity	Action	Operation	Point of inspiration	Experience
Study evolution and polymorphism of living organisms.	Read the materials available in your textbooks and Internet.	Read the chapter(s) from the textbook.	Need to get to know the theory for the video.	The action should create the idea of visualizing the topic. Concrete experience (CO).
		Read relevant web pages.		
	Create a storyboard and manuscript for the video.	Divide the work between group members	The experience from previous action.	Discussing the ideas, doing compromises, getting the plan ready. Reflective observation (RO) – Active Experimentation (AE).
		Draw/design the story		
Record and tag the video.		Record a video clip based on the storyboard.	Shared goal. Help users to find your clip easily	Creativity. Abstract Conceptualization (AC) - Active Experimentation (AE).
		Select a tag.		
		Write a description.		
Remix a story from clips in the service.		Select clips from service.	Create a video for others to see it.	Creativity. Abstract Conceptualization (AC) - Active Experimentation (AE).
		Press create remix.		
Watch videos from the service.		Watch.	Reflect what others have done, experiences they had.	Concrete Experience (CE) – Abstract Conceptualization.
		Comment, rate.		

There were certain patterns how students started to approach the tasks given. The different themes and procedures were analyzed from the video material uploaded to the MoViE (see Table 2).

Table 2. Analyze of the student’s video data

	8 th and 9 th grades	5 th grade	To sum up
Amount of videos	~76	~38	~114
THEMES: Biology & Geography The most common video types	a) Story: narrative with still images + commentary, b) only 1 frame + commentary c) interviews, d) story: different locations filmed + narration, e) reports on the studies	a) Authority interviews, b) student interviews, c) story: different locations filmed with narration, d) reports on the studies	Scripts, interviews, reports, stories, summaries
PROCEDURES: Ways/methods used for learning	a) Information seeking from textbooks/Internet, b) scripts, organizing a story with commentary, c) Preparing and making interviews, d) Reporting with self-reflection	a) Preparing and making interviews, b) organizing workable narrative with sound, voice-over and images. c) Reporting with self-reflection	Representing the results - final content, use of mobile videos as research/data gathering tools

Half of the evolution course used video form to create a story – from the beginning to the end for example in the history of plants evolution. They searched information and filmed plants and animals on the Internet or from traditional textbooks. These pictures and photos were then gathered as a story. Students edited the video clips in MoViE, which enabled them to create a coherent story on the matter. This learning technique resembles of assimilating learning style that emphasizes reflective observations and abstract conceptualization [29]. Other half had chosen to take a video of one image with the factual commentary on the subject. This could be seen as a diverging learning style that emphasizes concrete experience and reflective observation that views concrete situations from many perspectives and adapts by observation rather than by action. [29] The cultural geography course consisted of videos taken at different locations for example when illustrating recreation facilities in Kauniainen. Also these videos were based on creating a workable narrative whether they took videos of people (interviews) or locations [38]. Story telling is one of the new possibilities to learn and perform that mobile learning methods offer. See Figure 5.

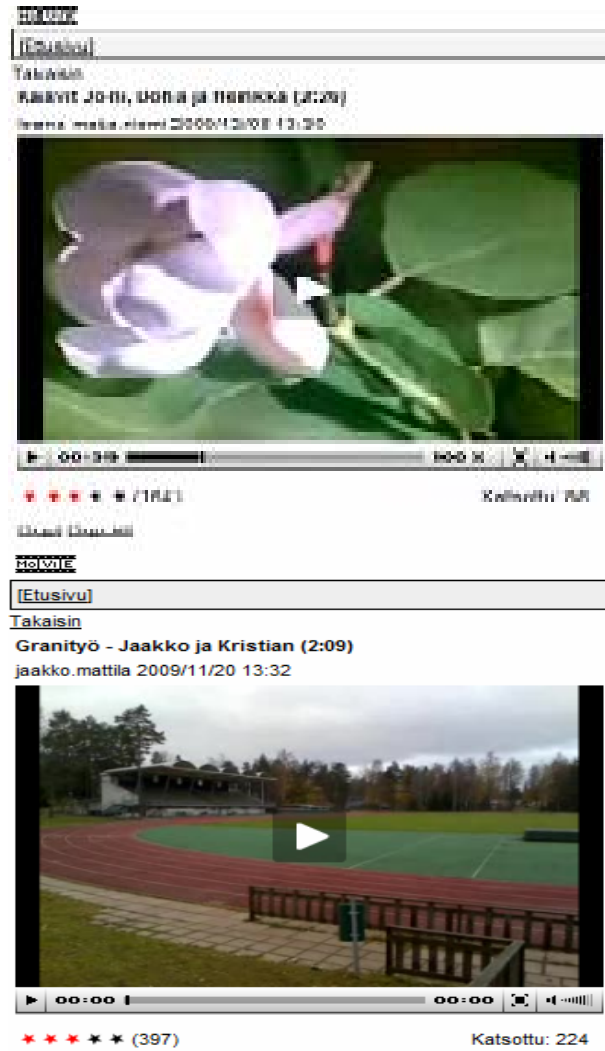


Figure 5. Still shots from the mobile videos on evolution of flora and locations in Kauniainen

The 8th graders chose to plan, organize and film their content usually inside the school building and its premises. The 9th graders took more liberties with the locations and the majority of the 9th graders took their videos outdoors and outside the school premises. This emphasizes in practice the benefits of mobile videos, highlighting the mobility, in learning and teaching. The 9th graders, based on the analyses of the video material, seem to have just chosen to do the videos and interviews hands-on and then after gathering the material, have compiled the information as a coherent video with the help of shooting several mobile videos and/or editing them in MoViE.

The 5th graders started their tasks by defining what their research question on the water theme was. They made videos around these questions and illustrated the theme they were interested in. They also used videos when elaborating on more specific themes such as waterpower. They also used mobile videos to collect and gather research material. For example, some of the groups build their own hydroelectric plants (at the museum of science, Heureka) out of Lego blocks and filmed the procedure, finally the functioning plant as well. See figure 6.

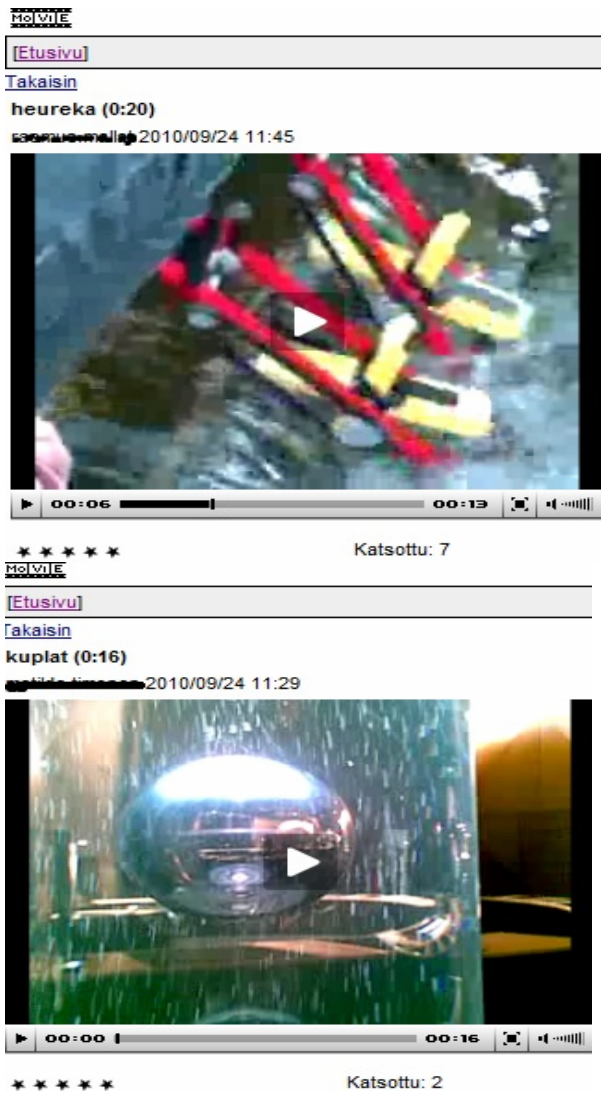


Figure 6. Still shots from the 5th graders videos - on the left the water plant made out of Lego blocks

This type of a working and learning style could be seen as a converging learning style, which is a combination of abstract conceptualization and active experimentation. It has features of Accomodating learning style as well, which emphasizes especially active experimentation and concrete experience. In this style, hands-on experiences and acting based on feelings rather than on logical analysis is dominant [29]. The younger participants also captured interesting or important sights. By this activity they also took digital notes with the help of videos. These videos include footage from different field trips for example from Heureka or water treatment plant with the commentary of students.

Overall the video material backs up the data gathered with Internet survey. Video material gives promising results since the students were using mobile videos innovatively and their enthusiasm was shown in the videos.

Learning on Mobile Video Application

This chapter elaborates on the certain parts of the previous study (Tuomi and Multisilta 2010) on use of MoViE in middle school by adding the similar data of younger students in reflection with each other. [38] The main aim of both of the studies was to measure how well MoViE promotes learning.

See Table 3. From the student's point of view, 32% of middle school and 64% elementary school students feel that one can learn by using MoViE. Both of the groups added positive aspects when describing the successful learning experience. This naturally emphasizes that positive experiences and attitudes toward the learning method and application will more likely produce better learning results as well.

"It's great to be able to work and learn with filming and mobile videos!" / M15

"It was fun to use MoViE because is nicer to work on the computer or with mobile phones than text books." / F11

On the other hand, 34% of middle school and 18% of elementary school seem to have differing opinions. Most of the open answers in this category included either comments on un-functionality of the application or its boredom.

"In my opinion, using MoViE is boring and I didn't learn a lot while using it.. It should be drastically improved in terms of getting students to get excited using it." / F16

"It was boring to use MoViE since it was sooo easy and it didn't work properly!" / M11

It is obvious that this is particularly individual dependent which has to be taken in notice since the background and for example technical competence of the student affect the learning experience and the result in this survey. It can also be somewhat difficult to measure the learning itself, especially by the student him/herself. However the use of self-evaluation is gaining more and more ground in processes of overall evaluation in school. Students are getting more and more familiar with setting targets for learning on different courses and then evaluating themselves afterwards. 42% of middle school and 22% of elementary school students did not find MoViE useful for learning purposes.

"You can't learn and I don't want to learn with it.." / F15

"You learn more in the classroom because you don't learn that much with MoViE." / F11

Yet 20% of middle and 51% of elementary student's felt MoViE is useful tool for learning.

"I was able to do tasks how I wanted and learn with a method (mobile videos) I really liked." / M14

"The new dimensions (mobile learning) wide the way of thinking and gives new experiences." / M14

"you get to be in some sense free but still you learned a lot while doing stuff." / F11

"It was great that you were able to learn but you didn't have to sit inside the classroom all day long." / F11

Table 3: MoViE and learning experiences

Question/claim (1-to-5 rating scale)	8th & 9th grades Agree	8th & 9th grades Disagree	5th grade Agree	5th grade Disagree
1. One can learn through MoViE	32%	34%	64%	18%
2. MoViE was useful, it helped learning	20%	42%	51%	22%
3. Knew more after the MoViE based course(s)	53%	30%	81%	8%
4. MoViE inspired to learn	16%	52%	47%	24%
5. Would prefer mobile learning over traditional learning (yes/no)	60%	40%	88%	12%

Due to the use of MoViE, the student becomes more active performer and participator in the classroom. Whereas, when mobile videos are taken in the groups, there are usually roles for everybody – one can be a writer, a director or an actor for example. This gives a change to learn something from all of these positions at the same time. It is also possible that mobile learning actually gives possibility for shy performers to act on video. Because of this mobile learning enables more possibilities to participate, learn and deliver for all type of learners.

When it was asked whether MoViE inspired students to learn and carry out the assigned tasks or not, over half (52%) of the middle school and 24% of elementary students felt they were not particularly inspired.

"Using MoViE was boring! It just didn't motivate me to learn.." / F16

"It was boring because it is boring!" /F11

13% of middle and 47% of elementary students however felt that MoViE indeed inspired them to learn and fill their tasks.

"It was fun and inspiring since you learn new skills on the computer at the same time!" / M14

"I liked working with MoViE and it inspired to do things 'cause you didn't have to write anything!" / F10

When measuring the learning experiences, we chose a self-evaluation based question concerning the knowledge on taught subject after participation in MoViE course. What is promising, over half (53%) of the middle school and even 81% of elementary students state that they now know more than before taking the particular course. This emphasize that at least MoViE did not interrupt learning, on the contrary it seemed to support both teaching and learning. However, still 30% of middle and 8% of elementary students felt they did not learn more during the course.

When asked whether the students preferred studying and learning with MoViE over traditional ways of learning, 40% of middle and 12% of elementary students feel that they prefer traditional ways of learning better. It must be noted that the traditional ways of learning were not defined by the survey so the answers rely on the student's definitions of traditional learning methods.

"MoViE is a bit trifling and I didn't use it for anything else than uploading my video in it. It's nice to work on the computer, but MoViE didn't affect my normal studying and learning almost at all." / F15

"It was ok, but learn more from the text books and I like more traditional ways of learning." / F11

However, as a very positive outcome, the clear majority (60%) of middle school and 88% of elementary school students answered yes – they would prefer using MoViE rather to some of the more traditional methods and/or devices.

"Everything in it is brilliant and fun! You learn really well by using it – I would like to work with MoViE again, it is fun to take (mobile) videos!" / M15

"It's nice to take videos and I, myself, learn best by doing!" / M14

"It's nice to get information from the internet and work with mobile phones by taking pictures etc." / M11

"It was better than traditional ways of learning because it brought variety into our learning."/ F10

When it comes to the actual use of MoViE (See Table 4.), 44% of middle and 66% of elementary school students state that taking and sharing mobile video is a good way of showing learning process while only 20% and 6% seem to feel otherwise. This supports the fact that mobile learning can be beneficial to learners.

Table 4: Actual use of MoViE

Question/claim (1-to-5 rating scale)	8th & 9th grades Agree	8th & 9th grades Disagree	5th grade Agree	5th grade Disagree
1. Teacher supported enough	62%	12%	85%	4%
2. MoViE was easy and quick to learn	56%	18%	86%	10%
3. It was easy to represent results via mobile videos	44%	20%	66%	6%
5. Felt his/herself tech-savvy	72%	10%	71%	14%

It was also crucial to learn what the possible technical problem areas in MoViE were since they will have an impact on adapting technology. The majority (72%) of middle and elementary (71%) students felt that they were tech-savvy and

technically well aware. 62% of middle and 85% elementary students felt that they received enough guidance from the teacher during the course. Overall, it seems that MoViE was quite easy to learn since the majority (56%) of middle and elementary (86%) state that they learnt the use of MoViE quickly.

"It was really good, because it was simple! Not too many things at once! ☺" / F14

"It was easy to learn using MoViE since it was designed so well." / M15

"It was easy to use MoViE since the introductions were easy." / F11

"Using MoViE was easy since I always learn to use computers and mobile phones quickly." / F11

However, still 18% middle and 10% elementary students had different thoughts, mostly due to the technical difficulties. Still we must bear in mind that this was a pilot study with all the technical problems and unpredicted issues that naturally affect the experiences and attitudes toward MoViE and mobile learning in general.

"The use was troublesome, because the application didn't work!" / F15

"It's too difficult to organize the video clips in right order.." / M14

"It was difficult for me since I'm not very good technology." / F11

"MoViE and the mobile phones stopped working constantly and we had to restart them all over again. / M11

Comparative findings

The comparative study between students in different ages and their attitudes towards mobile learning gives answers to questions whether there are huge differences between today's "diginatives" when it comes to the use of social media and mobile devices in the classrooms. The differences were not that big after all. On the contrary it seems that both of the groups have quite similar attitudes concerning 21st century's school. In the actual pilot studies, the elementary school students seem to have expanded the use of mobile videos more innovatively than the older students. The younger students exploited the mobile videos throughout the whole process while middle school students were mainly concentrating on creating the final results on video. Of course this has to do with the nature of the tasks given to the students. Like said, the elementary school's project, the Water route, was based on the idea of inquiry learning which automatically defines learning procedures in certain direction.

The elementary students were using mobile videos as tools to gather material way more than the middle school students. The younger students were making digital notes with mobile videos, which was proven to be a good idea. The students were able to film whatever they found important and speak

about the topic on video in more detail. After the field trips the digital notes were to be found on the MoViE whenever needed. The middle school students preferred remixing their videos afterwards, which emphasizes that they saw the MoViE more of a moviemaker than data collection tool.

Attitudes towards MoViE and mobile learning in general were overall positive in both groups. However, the elementary school students seem to have been more excited than the older students. Probably because they may have felt Water route in whole as sort of an adventure in which included field trips to interesting museums and other sites.

"We got to go different places and made trips with the class for example to the Heureka museum." / F11

"The trips were fun and it was refreshing to our school work." / F11

This emphasizes the positive side of learning mobile. One of the fundamental advantages is the ability for the user to get learning done when they move from one place to another, since mobile devices through their portability allows this facility while being mobile. [17]

In whole the younger students' percentages were much more positive than teenagers numerical results. The 5th graders were more open to new stuff and less critical to fulfill assignments given during the pilot courses. This probably has a lot to do with the fact that it might be a bit more challenging to get students in the age of fifteen to get excited on something compared to students around the age of ten. Both of the groups had similar technical difficulties despite the fact that in both groups majority of students felt itself tech-savvy. This seems to pinpoint that there really is not that much differences in the technical skills between elementary and middle school students nowadays. Overall, the results on attitudes towards mobile learning were promising in both cases since majority of both of the groups - The 88% of elementary students and 60% of middle school students - chose mobile learning rather than the traditional ways of learning.

"It brought variety into learning and classroom." / F15

"I like digital assignments more than the ones that have to be written on the paper with pen - the hand won't get tired etc." / M11

Finally, 69% of younger and 67% of older participants would be willing to use MoViE and mobile videos in the future as well.

"It was great to have fun with the class!! It was a blast!!" / F14 I liked it because the old ways of learning and learning methods are worn and dull. / M15

"Hmm.. I don't know :) but it would be good if MoViE could be used in every subject." / M11

"It's good since you really don't have to do traditional homework :)" / M11

V. Possible Problem Areas Worth Noticing

First of all, it must be taking into account that not all parents are willing to let their children appear on the content created and watched on the Internet. This is a problematic situation since the schools are using online environments and digital capturing more and more as a part of school's normal routines. Parents naturally are allowed to decide whether the under-aged student is allowed to appear in the material or not. When forbidden, it creates lots of problems to the teacher since it makes the use and monitoring of digital devices complicated. It also makes it hard to hand out tasks to students if some of them are not able to take part in them. Hopefully this issue will be solved in the near future. Otherwise it could hinder the use of social media and mobile devices in the classrooms.

Secondly, in both of the cases it became evident that it is crucial in today's media technologically well-equipped classrooms to teach the content produced and consumed in media as well. This issue first rose when the middle school students' videos were analyzed. [38] It is something that media education was first brought up for and it is tackling these issues constantly since the media field is changing rapidly. This informal use of technology is part of today's learning and school's task is to teach the appropriate use and creation of the media contents.

Working with digital literature constitutes an excellent way of teaching students to reflect on the use of digital language, media and culture. [6] Practical experience provides students with a better understanding of both the possibilities and the limitations of digital technology. However, it can be difficult to combine for example the factual and fictive use of mobile videos. Especially some of the older students seem to have had a clear vision of how published video on the Internet should look like. This vision has evolved from video types that are common for example on YouTube, which is why both of the groups were eager to compare MoViE with YouTube.

"The MoViE should be more like YouTube, like modern."/M14

"MoViE was boring since there were only some videos of nature and water and stuff. There could have been music videos as such like in YouTube."/F10

This sort of idea of "mobile video" can contain bad language, swearing and silly stunts. Also the youth culture and its prominent features were in the contents of the videos. [38] See Figure 7.



Figure 7. There were a lot humor and features of today's youth culture to be seen on the 8th and 9th grader's videos.

There were swearing on both course materials; a lot of laughter and some bad language. There were some problems with the appropriate behavior due to this idea of informal video form.

"The teacher did criticize my video contents.. ;)" /M15

"Well, I did swear on video couple of times.. ☺" /F15

The inappropriate content creation and behavior on videos were not that big of a problem to younger students. However, it is seen that for example swearing might become a bigger problem in the future, especially for the boys apparently.

"Almost all of the boys swear on the videos and we had to film them all over again."/F11

"The boys had some difficulties with the rules."/F11

Also the question of privacy issues is important. [38] Not forgetting the security and copyright issues that should be carefully considered according to for example Lam et al. (2010) [18].

Feelings of awkwardness were experienced in both groups. These feelings were due to the performance on the videos and how the students looked and sounded on them. Couple of participants in both groups stated that it had been awkward to appear on the video that every classmate was able to watch. This was a problem despite the fact that MoViE enables private groups, which means that only the groups members are allowed to see the footage, it is not public in any other way.

"From time to time, I looked stupid on the video.!" /F16

"Some of the videos became public and that was not nice at all" /F11

VI. Final Thoughts

The skill of multi-tasking is definitely one of the most significant skills of the 21st century [1]. Mobility is one of the key factors in these different mediated communication situations and therefore, one of the most important skills of

the 21st century's students should adapt, is the mobile multitasking in several (mobile) platforms and (learning) environments at the same time.

To summarize, MoViE did fit well for learning purposes in both of the cases. The mobile videos fit in both showing (learning) results and for digital data gathering as well. Both of the student groups felt MoViE was technically very easy to learn but at the same time both groups did criticize the technical difficulties and errors that occurred while using MoViE. These technical problem areas should be solved in order to make MoViE even more functioning. The use of mobile phones was easily adopted in both groups and the use of mobile phones are strongly encouraged in the future research as well since nowadays it is a device majority carries and it really enables the feeling of any place, any time. [39] There is place for mobile videos in more traditional learning methods and in both groups; the students felt they had learnt something during the pilot courses, which is promising for the future. The future research will include other tryouts of MoViE in teaching, in different schools and subjects also in the international level and from multicultural point of view. Social media based mobile learning environments could be useful in teaching and learning in multicultural environments.

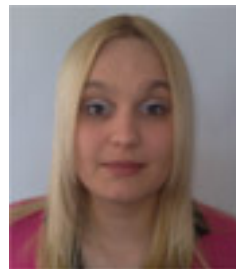
It can be stated that learning with mobile video material can deepen the learning when done properly [38]. To conclude, today's learning should be built on what the young people already do and know. [1] Based on this study, mobile social media is useful tool for school projects in different ages. The social and creative aspects of videos make learning more engaging and authentic. [35] It is still crucial to negotiate the boundaries on social media content creation in "school context" and to also teach the appropriate contents in the eyes of media education, critical media literacy. The social aspect around filming the mobile videos is however important since in both cases, groups stated it was fun to work together with the class. Of course the technical difficulties made working with MoViE sometimes annoying and frustrating but still, when it comes to learning, it is quite ideal that the students feel the tasks and procedures somewhat fun while leaning. This is why it is important not to restrict the use of videos too strictly. On the contrary, the students should be encouraged to exploit the visual features mobile videos enable as freely as possible. It is just a question of common rules like in the classrooms it usually is. The making of meaningful videos using social media services, i.e telling the story with community created video should also be taught when mobile social video tools are integrated to teaching and learning. We believe this is a part of 21st century skills needed in future society [38].

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