NBE 2011 CONFERENCE

Social Media in the Middle of Nowhere

– NBE 2011 Conference

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(Eds.)

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Network-Based Education 2011 Conference
The Social Media in the Middle of Nowhere

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Preface

Dear NBE 2011 Conference Participants,

We take great pleasure in welcoming you all to the NBE 2011 international conference at Sallatunturi, Finland. The NBE has increasingly become an informal and friendly conference which participants attend to exchange ideas and information regarding *social media, technologies in teaching and learning, learning, learning environments and media education.*

The first international NBE conference was held in 2005 and the second, the NBE *Power of Media in Education* conference, was held in 2007. The third NBE conference was held jointly with the ISATT conference in 2009. These three conferences were organized at the University of Lapland, in Rovaniemi, Finland. The fourth NBE Conference, *The Social Media in the Middle of Nowhere***,** will be held in Sallatunturi, Salla, Finland, in 20–22 June 2011.

We are greatly honored to have top keynote and invited speakers who are excellent representatives of the theme of the NBE 2011 conference. We are particularly grateful to Executive Director Keith Devlin from Stanford University, H-STAR Institute, USA; to Associate Professor Jukka M. Laitamäki, from New York University, USA, and to Professor Yngve Troye Nordkvelle from Lillehammer University College, Norway, for their willingness to share their expertise with conference participants.

For this conference, we received 19 submissions, 17 of which will be presented, with 15 papers being published in the conference proceedings. We take this opportunity to thank the review board members who have helped ensure that this conference will be of such high quality. The conference presentations cover a large number of topics relating to the theme of the conference. The most significant domains include: *Play and Game-Based Learning, Pedagogical Models, ICT and Mobile Technologies in Teaching and Learning, Virtual and Simulation-Based Learning, Personal Learning Environments and Social Media*.

We are very grateful to the members of the Programme Committee for their altruistic contributions to the success of our conference. The venue of this NBE 2011 conference is unique: Sallatunturi is actually in the middle of nowhere, in Finnish Lapland. Our conference is hosted by the University of Lapland, the northernmost of all universities of the European Union. This will guarantee us a splendid setting in which to meet, to share and feel at home.

Looking forward to meeting you all at Sallatunturi in June 2011!

Professor Heli Ruokamo,

Chair of the Organizing Committee

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Project Manager, Ph.D Miikka Eriksson; University Lecturer, PhD. Leo Pekkala; Researcher, M.Ed. Hanna Vuojärvi; and Conference Coordinator Marja-Leena Porsanger

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Social Media in the Middle of Manhattan

Mythbusting the Digital Native

Social Media in the Middle of Manhattan: An Educator's Perspective

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This study addresses social media in the United States with focus on Manhattan hospitality, travel and tourism industries. It offers an educator's perspective to the U.S. social media markets and marketing concepts. The paper addresses social media consumer profiles and activities including the emergency of hyper-interactive consumer who is hyper-connected, hyperactive, hyper-engaged and hyper-informed. It introduces several best practices and case studies that hospitality, travel and tourism industry executives and educators can utilize. The paper concludes with social media applications in higher education and urges educators to apply social media based learning tools that can make students more engaged, attached and loyal members of the learning community.

Keywords: social media, social networking, best practices, learning

1 Introduction

Social media technologies such as Facebook, Twitter and YouTube provide new marketing tools for executives in the hospitality, tourism and travel industries. This study aims at understanding why social media has become an important tool for hospitality, tourism and travel marketing. It investigates the role of social media in the context of two established marketing concepts of AIDA (attention-interest-desire-action) by E. St. Elmo Lewis (1898) and brand resonance by Kevin Lane Keller (2008). The study first introduces the U.S. social media markets and then social media consumer profiles and activities including the emergency of hyper-interactive consumer who is hyper-connected, hyperactive, hyper-engaged and hyper-informed. The study investigates how marketers can use social media as a part of the AIDA and brand resonance concepts that appeal to hyper-interactive consumers. It introduces several best practices and case studies that hospitality, travel and tourism industry executives and educators can utilize. The study concludes with an educator's perspective how social media based learning experiences can both substitute and support traditional teaching and learning.

2 Aims and objectives

It is important for hospitality, tourism and travel executives and educators to know why social media and social networking has become such an important marketing tool. The objective of this study is to extend previous research by investigating how social media works in the context of the AIDA and brand resonance marketing concepts. This study addresses this critical question first by understanding the growth of the U.S. social media markets and then by investigating the applicability of social media as an effective marketing tool. It summarizes key lessons, best practices and case studies of successful use of social media in the hospitality, tourism and travel industries. The study concludes with implications of social media for educators.

3 Background

There are four streams of research that are relevant for this study. First, research regarding the growth and characteristics of U.S. social media markets. The second area of research addresses the AIDA and brand resonance marketing concepts and the applicability of social media to these concepts. The third area of research addresses best practices and case studies of successful use of social media in hospitality, tourism and travel marketing with focus on Manhattan. The fourth area addresses the applicability of social media in higher education.

3.1 U.S. Social Media Markets and Hyper-Interactive Consumers

Social media is rapidly changing the landscape of hospitality, tourism and travel marketing and education. While it took 38 years for radio and 13 years for TV to reach 50 million users, it took less than nine months for Facebook to reach 100 million users and for iPhone to have 1 billion applications. Today's consumers use social media for researching (e.g. tripadvisor, Wikitravel, Where I've been, nextstop), for planning (e.g. wikidot.com, Facebook, google docs, Tripit), for travelling (e.g. loopt), and for sharing (e.g. flickr, YouTube, Facebook) their vacation experiencess. This enormous growth of social media combined with mobile-web has given a birth for a new breed of consumers that Starkow and Mechoso Safer (3/2011) call *hyper-interactive* with following four characteristics:

- *Hyper-connected*: these consumers are communicating in real-time with their friends, network, colleagues, family and peers via text, email, social networks, online content sharing and reviews.
- *Hyperactive*: these consumers exhibit short attention spans in an environment of constant information overload. They also exhibit impulsive behavior with no tolerance for dull and static content that is not engaging.
- *Hyper-engaged*: these consumers are passionate, opinionated, easily excitable and fully engaged. They love sharing opinions, reviews and "cool stuff", and appreciate the opportunity to be able to do that easily.
- *Hyper-informed*: these consumers live in the 24/7 mobile and social environment, in which there is a real "hunger" for fresh and engaging content.

The NEXTGen Traveler survey by Ypartnership and PhoCusWright found that this new type of travel consumers are heavy users of wireless and digital technology defined by following statistics:

Social Media Aficionado

- 57% of US Internet users maintained a social networking site profile in 2009 vs. 45% in 2007.
- Social media is popular even among the mature generation (63-75 years): 36% of them had a social network profile in 2009 vs. 10% in 2007.

Facebook Devotee

- There are more than 500 million active users.
- 50% of active users log on to Facebook in any given day.
- Average user has 130 friends on the site.
- Average user writes 25 comments on Facebook each month.

Twitter Addict

- According to comScore, 75 million people worldwide visited Twitter.com in January 2010 which represents a growth of 1,100% in a year. Compete.com estimates that 23.5 million of those came from the U.S. alone.
- According to Twitter, some 50 million tweets are sent in one day and tweets grew 1,400% in 2009.
- According to Alexa.com, Twitter.com is the 9^{th} most popular website in the world and 8^{th} in the U.S on 5/27/2011.

- Twitter has a bounce rate of roughly 39% (i.e., 39% of visits consist of only one pageview). Twitter's visitors view an average of 3.5 unique pages per day. Visitors to the site spend roughly seven minutes per visit to the site and 51 seconds per pageview.

Mobile Obsession

- 93.6% mobile phone penetration in the U.S. in 2009.
- 67% of travellers and 77% of frequent business travellers with Web-enabled mobile devices have already used their devices to find local services (e.g. lodging) and attractions in 2009.
- 71% of U.S. adults felt it was safe to make a purchase via a mobile phone, 43% are willing to purchase hotel rooms, and 40% tickets for travel via their mobile devices in 2009.

SMS/Texting Fanatic

- Over a trillion text messages were sent worldwide in 2008.
- On average there were 357 texts vs. 204 phone calls/per month per cell phone subscriber in 2008.

Customer Review Enthusiast

- 89% of U.S. online buyers read customer reviews before they buy in 2009.
- 84% of respondents read a review of a product or service in 2009.

Hyper-interactive consumers are changing the global consumer markets and in the first quarter of 2011, Facebook overtook Google as the most popular social network ID used to sign in to websites to share content. According to **Janrain** (company blog 4/14/2011) Facebook had 35% while Google had 31% of the worldwide market followed by Yahoo (13%), Twitter (7%), Windows Live (6%) and other social networks (8% Myspace, AOL, Linkedin). There are several **benefits to social sign-in**. For marketers, there is an increase in engagement and more profile data for targeting. For consumers, social sign-in is an easy and simplified process whivh provides flexibility to choose sign-in preference and verifies a user's identity. Facebook was also the worldwide market leader in terms of sharing content with 58% market share followed by Twitter (32%), Linkedin (13%), Yahoo (9%) and Myspace (4%). Interestingly most consumers are not yet comfortable using Twitter as their main social login (only 7%), but they do find it useful for content sharing (32%). Social sharing is important because it boosts word-of-mouth and many websites get referrals from content shared on social sites. Additionally, different social sites often have different focuses, which explains why smaller social networks are popular (**www.eMarketer.com** article 4/28, 2011).

3.2 AIDA and Brand Resonance Concepts

AIDA is an acronym that stands for *attention-interest-desire-action* activities that a marketer has to accomplish in order to sell a product or service. The AIDA concept is attributed to an American advertising and sales pioneer E. St. Elmo Lewis who introduced it in 1898 (http://en.wikipedia.org/wiki/AIDA-marketing). He created the AIDA funnel model explaining personal selling in the U.S. life insurance business. Based on his research of successful sales people, Lewis proposed that they applied the following hierarchical AIDA process that was based on the four cognitive phases that buyers follow when accepting a new idea or purchasing a new product:

A (attention) – attracting the attention of the consumer

I (interest) – raising consumer interest by demonstrating advantages and benefits of the product

D (desire) – convincing consumers that they desire this product because it will satisfy their needs and wants

A (action) – leading consumers towards taking action and purchasing the product

Social media and social networking are replacing the traditional sales person and substituting the sales push with more effective consumer generated pull based social media. The reach and credibility of consumer generated social media can over power the most talented sales person. Social media can be more effective and credible way of drawing consumer attention than traditional sales call or marketing which consumers (especially younger generations) often perceive untrusty propaganda. Research by YPartnership (5/2011) shows that family and friends are the most important sources of information for the first two stages of travel purchase decisions when consumer seeks for *ideas & inspiration* and *insights & advice*. These results suggest that consumer generated social media can be a more effective tool for gaining consumer *attention, interest* and *desire* than traditional marketing, advertising and sales. The online travel agency and travel service suppliers' own websites are the most important sources of information for the third step when consumer *seeks pricing information*. The online travel agency and internet search websites are the most important sources of information for the fourth step when consumer *compares destinations*.

It is the last *action* phase where traditional sales person may still be a more effective way to call the consumer to action than social media. However, this is changing as advances in technology such as booking engines on mobile websites have improved the call to action by social media and mobile websites. As smart phones become the norm and mobile internet access a part of everyday life, mobile habits are changing and online activities are growing more popular. Search, one of the top online activities overall, is becoming more important on mobile for both users and advertisers. eMarketer estimates that mobile search ad spending will make up 27% of the U.S. mobile ad market this year, rising to 34% by 2014 (www.eMarketer.com article 5/11, 2011). Mobile search could prove very valuable for businesses due to the on-the-go nature of it's usage. A search on the desktop web might work in the attention and interest stages of the AIDA purchase funnel. However, those searching via mobile are likely to be in the desire and action stages of the AIDA purchase funnel and looking for immediately useful information for a purchase. According to research from Google and Ipsos OTX MediaCT, smart phone users performing a search are more likely to be in the later stages of the AIDA purchase funnel, than they are to be in the early stages. The most common single action after a smart phone search was to visit a store in person, done by 55% of respondents. Overall, more than half of smart phone users made a purchase after their mobile search, whether in a store, online or via their phone. Smart phone users searching for information on local businesses or services were also highly likely to take action. A majority of searchers visited the business' website, got directions, or called or visited the business. Traditional media were the biggest motivation for beginning a search on a smart phone, followed by word-of-mouth. More than one in four respondents conducted a mobile search after seeing a mobile ad, almost evenly split between search ads and display ads (www.eMarketer.com 5/11, 2011).

The traditional marketing and marketer is replaced with consumer generated social media which can be a more effective marketing tool than company generated marketing, advertising and sales. This shift to digital and social media is happening fast in the U.S. After plunging by 18.5% in 2009, ad spending on traditional media is on a slow rebound. eMarketer estimates that spending was up 2.1% in 2010, to $127.2 billion (www.eMarketer.com article 5/20, 2011). But rather than making a true recovery, spending will seesaw in coming years, hovering under $130 billion through 2015—far from the $165.94 billion recorded in 2007. Online and mobile ad spending, by contrast, will post real gains. The increase in consumer time spent with the internet and mobile phones is the reason why advertisers are following this audience to online and on mobile devices. For some traditional media, such as newspapers, the shift to digital has spelled serious difficulties.

Research by YPartnership (5/2011) shows that online travel agency and travel service suppliers' own websites are the most important sources of information when the consumer makes the travel purchase decisions. YPartnership's 2010 *Portrait of American Travelers* (8/2010 – see Table 1) found that nearly two in ten travelers have downloaded a travel-related application (app) to their smartphone. Among them, nearly one-half have navigated a destination using the built in GPS functionality or searched for the latest information on flight schedules and delays. Nearly three in ten have compared airfares or hotel rates or shared information or photos about their travel experiences using their smartphone. Approximately one in six has booked air travel or lodging or viewed a virtual visitor guide that provides information on things to do and see while visiting a destination. Finally, more than one in ten active travelers has used their smartphone to download and redeem mobile coupons, while one in twenty has downloaded an audio walking tour of a specific destination. The study concluded that mobile devices are destined to play an increasingly important role in the distribution and sale of travel services in years ahead.

Table 1. Percentage of Consumers Who Have Downloaded a Travel-related Application on Their Smartphone (source: YPartnership 2010 Portrait of American Travelers)

	2010 %
Have Downloaded a Travel-related Application (app) to Your Smartphone*	19
Activities Engaged in with a Smartphone*	
Navigate a destination using your phone's GPS functionality	47
Search for the latest information on flight schedules and delays	46
Comparison shop airfares and hotel rates	29
Share information and photos about your travel experiences	28
Book air travel or lodging	18
View virtual visitor guides that provide information on things to do and see in a destination	15
Download and use mobile coupons from your phone	11
Download an audio walking tour of a destination to your phone	6

* Among those who access the Internet from a cell phone that is a smartphone such as an iPhone, Blackberry, Palm, etc.

In conclusion, social media offers great potential for improving the effectiveness of the AIDA purchase funnel across all four stages of attention, interest, desire and action.

Keller (1998) introduced the Consumer Based Brand Equity (CBBE) model consisting of the following six concepts: brand salience, performance, imagery, judgements, feelings and resonance. Keller states that "brand resonance is the pinnacle of the CBBE model and provides important focus and priority for decision making about marketing. Marketers building brands should use brand resonance as a goal and a means to interpret their marketing activities." Brand resonance consists of brand loyalty, brand attachment, brand community and brand engagement. Brands with strong resonance can capitalize on social media where consumers can easily express their *loyalty* towards the brand (i.e. "I would go out of my way to use this brand) and their *attachment* to the brand (i.e. "I really love this brand"). Social network is an excellent forum where consumers can easily express their desire to be part of the brand *community* (i.e. "I really identify with other people who use this brand" and *engage* with the brand (i.e. "I really like to talk about this brand to others").

Social media and social networking are excellent tools for building brand *loyalty* and brand *community*. According to the February 2011 Affluence Collaborative survey (see Table 2) the main reason (44.3%) cited by general population for connecting with brands on social networks was to receive deals and discounts. The love of the brand (36.9%) and keeping up with the brand news (27.5%) were the next most important reasons for following brands/companies on social networks. The least-cited reason was to be entertained, suggesting that social media marketers still need to provide consumers with value rather than just pure entertainment. These findings coincide with earlier research from ExactTarget, which showed that an important component of liking a brand on Facebook was due not just to an affinity, but as a means of self-expression for others to see (www.eMarketer.com article 5/10, 2011). This promotional desire was more pronounced in Facebook users than Twitter followers or email subscribers. Consumers in their "love of the brands" act as engaged brand ambassadors.

Table 2. Reasons for Following Brands/Companies on social Media Networks According to US Affluent vs. General Population internet Users, by Income, Feb 2011 (source: www.emarketer.com article 5/10, 2011)

Reasons for Following Brands/Companies on Social Networks According to US Affluent vs. General Population Internet Users, by Income, Feb 2011
% of respondents in each group

	Affluents ($200K-$500K)	Affluents ($500K+)	General population
I wanted to get deals/discounts	39.4%	29.0%	44.3%
I love the brand and wanted to follow it	39.7%	52.3%	36.9%
I wanted to keep up with news about them	31.3%	34.8%	27.5%
I noticed someone following the brand/company profile	22.2%	31.0%	18.8%
The social network recommended it	21.2%	33.5%	16.1%
An ad (print, TV, online) led me to it	25.9%	31.0%	14.8%
It was mentioned in an article	22.6%	23.9%	12.8%
I have a professional interest	18.9%	15.5%	10.7%
Their tweets/posts are entertaining	3.4%	7.7%	9.4%

Source: The Affluence Collaborative survey conducted by NowResearch, April 13, 2011

127553 www.eMarketer.com

Regarding brand *attachment* and brand *engagement*, social media such as Facebook provide an excellent tool for marketers to engage consumers as fans with their brands. Growing a base of Facebook fans is often a major objective for social media marketers. Whether through special offers available only to fans, the promise of exclusive content or simply through a compelling campaign that reaches already loyal customers, marketers are building up their presence on Facebook pages and hoping consumers flock there as well (www.eMarketer.com article 5/9, 2011). But as fan bases grow, the danger increases that the larger community will be less close-knit and engaged than before. Link-sharing solutions provider Visibli analyzed Facebook pages with at least 100,000 "likes" and found that for brands and media organizations, pages with more fans received fewer "likes" on each individual post. Engagement went down as the number of people involved went up. Brands are behind both artists and media organizations when it comes to average number of "likes" and comments per post. The research from Visibli found that half of all "likes" happen within 1 hour and 20 minutes of posting, and 70% happen within 4 hours. "Likes" taper off over time, until about 95% are received within 22 hours. These results suggest that brands should give messages time to play out and maximize engagement before updating.

In conclusion, brand resonance concept can capitalize on social media as an effective way of connecting with consumers.

3.3 Social Media Best Practices and Case Studies

Having a branded Facebook page has become essential for many businesses and most Fortune 100 companies now use Facebook for marketing. HubSpot's The 2011 State of Inbound Marketing report found that the company blog was most important (62%) social media site followed by Facebook (44%), YouTube (44%), Twitter (38%), Flicker (11%), Digg (9%), StumbleUpon (6%) and Myspace (4%). A study by Wong, Doody, Crandall, Wiener (2/22, 2011 – see Table 3) provided a set of worldwide benchmarks for Facebook marketers. Among the 84 Facebook brand pages examined, 88% of their operators said they posted video content, 82% solicited fan stories or comments, 79% had their wall open for fan comments and 66% actively replied to fan posts and comments.

Table 3. Facebook Activity of Brands Worldwide, Nov 2010 (source: **www.emarketr.com** article 5/19, 2011)

Facebook Activity of Brands* Worldwide, Nov 2010	
Average number of fans	1,807,360
Average number of corporate posts per month	24
Average number of fan posts per month	857
Average number of "likes" per post	1,456
Average number of comments per post	157
% of brands on Facebook that...	
Post video content	88%
Solicit fan stories/comments	82%
Wall open to fan posts	79%
Actively reply to fan posts/comments	66%
Solicit photo submissions	39%
Post surveys/polls/quizzes for fun	39%
Promote contests	33%
Post surveys/polls/quizzes for research	32%

*Note: n=84 official Facebook pages; *based on Interbrand's "Best 100 Global Brands" report*
Source: WONGDOODY, "Facebook Global Best Practices," Feb 22, 2011

125502 www.eMarketer.com

Cost cutting due to the recession, and the exploding use of online tools have fundamentally changed the way corporate travel is marketed and booked. Business travelers' growing appetite for technology has played an important role in this evolution (www.eMarketer.com article 5/17, 2011). The U.S. business travel market has been improving and PhoCusWright has estimated that managed corporate travel grew 15% in 2010 and accounted for 36% of the total $255 billion travel market with continued growth during 2011. As travelers demand to use the same online travel tools for business as they use in their personal life, corporate travel professionals are seeing promise in social media. A May 2010 AirPlus International study found that 52.2% of European and North American travel management professionals said social media sites had the potential to increase traveler satisfaction through real time knowledge sharing, and 41.8% said that social media could help travel managers understand what is important to travelers. Mobile is also revolutionizing the travel industry by providing convenience and flexibility for travelers, and by helping travel managers track itineraries and expenses, better communicate with travelers and improve their security in the wake of crises. Mobile is also a potential source of revenue for travel suppliers as a way to sell ancillary services, such as food and beverages, upgrades, Wi-Fi access and entertainment (www.eMarketer.com article 5/17, 2011).

The 2010 Portrait of American Traveler by YPartnership (11/2010) found that among all active travelers in the U.S. (those who took at least one trip that required overnight accommodations during the previous 12 months) 46% had a page posted on a social site. Among these 46% of active travelers Facebook hadthe highest rate of market penetration (91%), followed by Linked In (24%) and MySpace (23%). Interestingly only 6% of active travelers reported that the content to which they have been exposed on social sites has had any significant influence on their final choice of a destination or travel service supplier. This low percentage can probably be explained with the following two insights (YPartnership 11/2010). First, when asked about their primary motivations for the use of social media, active travelers cite the expected: a new and novel way to stay in touch with old friends, to find and make new ones, and to share information, photos and other content about life events. Very few, if any, mention activities of a commercial nature such as sourcing good deals, comparison shopping for products and services, and the like. Second, the perceived credibility of the content of social media is low relative to the degree of credibility ascribed to other sources of information travelers typically consult when making destination and travel service supplier decisions as demonstrated by the percentage of active travelers who are "very/extremely" confident in the information they receive from the media sources listed along the "credibility continuum" below (see Figure 1):

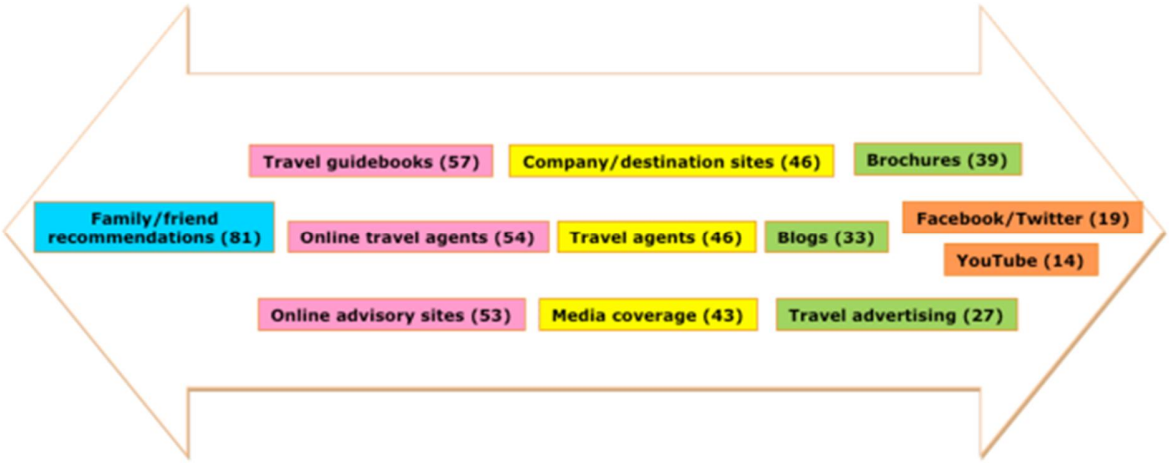

Figure 1. Percentage Of Active Travelers Who Have Confidence In Destination And Travel Service Supplier Information Obtained From The Listed Source (Source: Ypartnership 2010 Portrait of American Traveler)

According to Starkow and Mechoso Safer (3/2010) the company website has to become the face of the company to the outside world by engaging hyper-interactive consumers via a fully interactive Web 2.0 technologies. The interactivity of the website increases interaction with visitors, engages website users, generates interest, increases site stickiness, and ultimately increases bookings. The 4th annual Benchmark Survey on Hotel Internet Marketing Budget Planning and Best Practices by Hospitality eBusiness Strategies (HeBS) clearly shows that more hoteliers were planning to engage in Web 2.0 and social media initiatives in 2010 (see Table 4).

Table 4. The 4th Annual Benchmark Survey on Hotel Internet Marketing Budget Planning and Best Practices (source: Hospitality eBusiness Strategies)

What type of Web 2.0 & Social Media marketing initiatives are you planning for 2010?	2008	2009	2010
A blog on the hotel website	14.5%	14%	37.9%
'Share this site' and RSS on the website	N/A	N/A	24.1%
A photo sharing functionality on the hotel website	12.7%	4.7%	32.8%
Sweepstakes and contests on the hotel website	9%	3.5%	36.2%
Survey and comment card on the hotel website	18.4%	14%	31%
Subscribe to a reputation monitoring service	8.4%	2.3%	19%
Create profiles for my hotel(s) on the social networks (Facebook, Twitter, Flckr, etc.)	13.3%	14%	50%
Create and post videos on YouTube	N/A	N/A	46.6%
Actively participate in blogs that concern my hotel	12.7%	5.8%	24.1%
Advertise on social media sites (e.g. TripAdvisor, Facebook, etc.)	8.1%	15.1%	39.7%
I am not planning on Web 2.0 and Social Media initiatives for 2010	N/A	15.1%	6.9%

Based on the above and other industry research Hospitality eBusiness Strategies' consultants Starkow, Mechoso Safer, Mastrogiacomo and Sena (2011) suggest the following nine social media best practices:

1. Start a blog so that you can speak to consumers, and allow them to leave their feedback. This will benefit the company search engine optimization (SEO) as well.

2. Launch sweepstakes (e.g. Free Room Giveaway) that allow consumers to enter to win a free night's stay and refer the contest to their friends spreading it virally.

3. Let consumers show off their vacation photos by creating a photo sharing contest (always have an approval process before photos go live).

4. Post a fun scavenger hunt on the site for generating buzz, adding new hotel fans on Facebook and followers on Twitter, as well as new users with and opt-in email and text lists that generate incremental bookings.

5. Write interesting and engaging content.

6. Incorporate unique offers into your social media strategy.

7. Give fans and followers a reason to keep coming back for more.

8. Regularly post fresh content.

9. Brand your social media presence.

The following case studies illustrate several of these best practices.

Case Study 1: The Roger Smith Hotel's wide net of social media activities

The Roger Smith Hotel has only 130 rooms but it is one of the most successful Manhattan hotel in using social media.

According to the Hotel Manager, Mr. Ek Wongleecharoen, the hotel has 8924 Twitter followers and 3118 Facebook likes as of May 24, 2011. In addition to the Facebook fan page there is a blog, YouTube Channel and a Flickr photostream.

The goals of the hotel's social media campaigns focus on room sales assisted with Facebook and a Twitter promotional rates and social media events such as Social Media Breakfast with Social Media Club and other Mashable Parties. Social media strategies center around telling stories and providing interesting content about what is happening at the hotel. There are so many stories to be told about the personalities and people that the hotel does not need to do sales pitches, but instead produce interesting content that people are sharing and engaging with. Everything is people-driven and genuine; what you see online is what you get when you visit the hotel.

The Roger Smith is building an environment where everyone becomes a content generator. Multiple members of the staff are creating the hotel online presence and they frequently collaborate with other creative artists and guests. The hotel social website, RogerSmithLife.com, has a library of about 800 videos produced during last six years as a result of the event-driven calendar. The hotel staff is active in the New York City social media circles outside the hotel and they produce hyper-local stories that involve everyone and generate opportunities for face-to-face contacts.

Adam Wallace, Director of Digital Marketing has following best practices to share:

1. You don't need to reach millions of people to be successful, communicate directly and publicly with your customers and potential customers and this will scale out to impact your business.

2. Focus on relationships with niche communities, "everyone" is not an audience.

3. Be human, personal and open as a business.

The hotel's social media activities have produced the following results:

- Food and Beverage Sales up 32%
- Event revenues up 37%
- Estimated 75 to 175 rooms per month filled directly due to social media efforts. This may be fairly small compared to the 3 to 4000 usual monthly room bookings, but these rooms are booked by social media enthusiasts who talk about the hotel to their audiences either on blogs, Twitter, Facebook, photo sharing platforms, Youtube, or other channels.

Case study 2: NYC & Co. social media activities

NYC & Co. is the conference and visitors bureau of New York City. According to Ms. Carianne Carleo-Evangelist, Director of Arts & Cultural Programs, the NYC & Co. has implemented the following social media activities:

1. A tweetstakes in which NYC & Co. gave away tickets to an event series to their Twitter followers who answered specific questions of these events.
2. A social media seminar for NYC & Co. member companies teaching them how to make good use of social media for their business.
3. Twitter interviews with participants in "on the House" (NYC & Co.'s Off Broadway promotion) in Feb 2010 and street pole banners with a hashtag #OnTheHouse to increase mobile engagement.
4. Dedicated press twitter presence http://twitter.com/#!/nycgo_press.

Case Study 3: Interactive Sweepstakes on a Hotel Website in New York City

Hospitality eBusiness Strategies (2010) implemented a 30-Day Free Room Giveaway Interactive Sweepstakes featured on the hotel website. Participants entered daily to win a free night's stay, and an extra incentive of a $250 VISA Cash Card prize was awarded to the person who forwarded the sweepstakes to the most friends. The results included:

- Sweepstakes participants: 8,231
- New email list opt-ins: 1,624
- Sweepstakes forwarded to a friend: 443 times
- Sweepstakes mentioned in various travel publications
- Numerous tweets and re-tweets about the sweepstakes

Case study 4: JetBlue Airline Twitter Fares

JetBlue airline has a Twitter account (twitter.com/jetblue) which is very popular among consumers because the airline publishes some of its special airfares only via this Twitter account.

Case study 5: Times Square Marriot Marquis and Marriott Blog by Bill Marriott

Times Square Marriot Marquis has a Facebook page and Marriot International Hotels have a blog (blogs.marriott.com) where the company Chairman and CEO Bill Marriott Jr. answers consumer questions, comments their suggestions and shares important company news. The blog has several interest categories including books, brands, current affairs, diversity, education, employment, environment, film, food and drink, government, music, operations, personal, service, sports, technology, television, travel, web/tech and weblogs.

Case study 6: Inter-Continental Times Square and Barclay Hotels

Inter-Continental hotels pride themselves of "being in the know" of the local areas where the hotel is located. The Times Square and Barclay hotels in Manhattan have an *Explore The Area* tab on the hotel home page which introduces the Principle Concierge's hot tips and offers exclusive interactive maps with Wikipedia and rich photo content titled *Discover, Where to Eat & Drink* and *Where to Shop* in Manhattan.

Case study 7: W Times Square Hotel

W Times Square hotel is one of the leading boutique hotels in Manhattan. The hotel Facebook page offers rich media in terms on photos, videos, events, and discussions. *W Insider* takes the consumer to the Times Square "the center of the center of universe" and offers a free *Whatever you want – Whenever you want it* application which allows the consumer to stream music, order in and book a room. It offers polls on topics such as what music should be included in the next W Hotels CD and what would make a perfect birthday gift. The page includes *Wow Me* special offers and a calendar of *W Happenings.*

4 Implications for Educators

The technological democratization of the tools of production, distribution, content and supply has also entered the field of higher education (Anderson, 2006). As a result of these new technologies Li and Bernoff (2008) have identified the new shifting pattern of behaviour they call "*groundswell which is a social trend in which people use technologies to get things they need from each other, rather than from traditional institutions like corporations.*" Higher education is one of the traditional institutions that need to change and adapt to this new shift in *groundswell* driven student behaviour. Following is a summary of some early studies of using web 2.0 and social media in education.

Greenhow et al. (2009) suggest that Web 2.0 media are applicable for enhancing generation and sharing of knowledge in educational research communities. They categorized Web 2.0 technologies into *interconnections, content creation and mixing* and *interactivity*. Dede (2009) studied ten forms of emerging educational Web 2.0 technologies in terms of their potential to enhance learning by promoting creativity, collaboration, and sharing. He categorized them into following three groups: *sharing technologies* (communal bookmarking, photo and video sharing, social networking, and writer's workshops and fan fiction); *thinking technologies* (blogs, podcasts and online discussion forums); and *co-creating* (wikis and collaborative file creation, mash-ups and collective media creation, and collaborative social change communities).

In the area of work related learning social media has been found to provide benefits especially for Millenials (Patel, 2010). The key benefits for Millenials and Baby Boomers included *learn more in less time* (38.1% of Millenials answering *high* or *very high* and 22.2% of Baby Boomers); *learn truly useful things* (34.2% and 22.5%); *get better work done* (29.6% and 19.3%); and *get more work done* (21.5% and 12.5%). These results clearly indicate that Millenials are more ready to capitalize on the benefits of social media in the context of work related learning. Shared work spaces (SharePoint and Google Docs) were the most used social media tools at work with 42% of respondents using them often or all the time. The other popular tools included social networks (Facebook and Linkedin 19.9%), Wikis (19.2%), Blogs (WordPress and LiveJournal 16.7%), Podcasts (14.9%), shared media (YouTube and Flickr 11.6%), and Micro-blogs (Twitter and Yammer 7.7%). Respondent did not use much social bookmarking (Digg and reddit 2.5%), virtual worlds (Second Life 1.3%) or augmented realities (Layer 0.4%) for their work related learning.

Laitamaki (2011) compared virtuality (i.e. hotel web site reviews) and reality (i.e. hotel field visit) based learning experiences. The results of this exploratory study suggested that reality based learning experiences had a stronger influence on student hotel brand preferences than virtuality based. Aleman and Wartman (2009) investigated social networking on campus and provided both students' and administrators' views of the immediacy of its impact on both the virtual and real learning environments. Wankel (2009) provided several examples how to use Facebook, blogs, YouTube, MySpace, and Second Life in management education. Gerlich et al. (2010) developed a social media affinity scale and found no significant gender differences among college students' usage of social media. Educators have been slow to adopt social media as a teaching tool, despite several potential pedagogical benefits including the opportunities for students to create, swap, and manipulate information on many levels and in real time (Moody, 2010). Adding social media to lectures, textbooks, and traditional discussion prepares students for modern communications and encourages the less outspoken to

contribute. By creating a Facebook page for the course educators can encourage students to post, share, and comment on important topics outside and inside the classroom. The open nature of social networks invites a broad range of perspectives and encourages students to think critically about what they hear and see online (Moody, 2010). Matteson (2010) suggested using the Twitter for checking student understanding of the subject matter, for online polling, and for live discussion feeds. Twitter can also be used for collaborative writing, homework collaboration and responses as well as for connecting with the world outside classroom.

In summary, the above studies suggest that educators have been slow in adopting social media in teaching and learning, but given the overwhelming adaptation of social media by college students, educators should capitalize on social media as a new learning tool that engages students in ways not previously possible.

5 Conclusions

In conclusion, educators should start capitalizing on social media especially now when Millenials are demanding more social media based learning tools. It is time for the educators to capitalize on social media learning tools that can make students engaged, attached, and loyal members of the learning community – similar to brands with strong resonance.

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Mythbusting “the digital native”

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For more than a decade, researchers and popular writers in the area of educational technology have announced the advent of the “digitally native”, or similar: homo zappiens, Net Generation etc.. Governments, education policymakers and teachers in schools are concerned about what this eventually will mean for education. The general claim is that the new learners learn in significant new ways and that education needs to redesign its entire working system to adjust to this new generation of learners. However, research on what students actually know and are able to do with their new technologies reveals that these terms are simple characterisations of a generation of students. The presentation will use examples and cases from the UK, US and Norway, and will explore some of the beliefs and views of students who use ICT extensively in their studies. This presentation will dive into some of the complexities related to age, academic direction, gender and learning contexts of students and undermine the myth of the “digital native”- as little more than a myth.

Keywords: digital native, change, higher education, myth, student learning, ICT in education

1 Introduction

Until recently “Digital native” has been one of the most popular terms to describe the new generation of students who have been brought up in mediarich environments, and who have been brought up in families with computers and videogames since newborn. The Network generation, Generation N, X and Y have all been suggested, along with more poetic expressions like “Homo Zappiens”. Apart from the interesting process of coining trends and waves, few terms have become as established as “the digital native”, and the term therefore deserves a more thorough investigation. The investigation in this paper will be both on a conceptual level, as well as more analytical and empirical, asking how “nativeness” can be measured and if international comparisons can be of any value. “Mythbusting” has become one of the most popular programmes broadcasted by “Discovery Channel”, where Jamie Hyneman and Adam Savage “busts” myths proposed by their viewers.[1] In this paper I will try and bust the myth of the “digital native”.

In Norway “Digital competence” has become the dominant term, suggesting digital competencies as one of the five most important sets of skills. Accordingly, all curricula for primary and secondary schools contain a set of requirements regarding digital skills, described for all school subjects from Grade 1-13. Norwegians often see themselves as at the forefront of developing such operationalisations of what competencies and qualifications related to ”the digital” mean. It appears to be a global race between nations to find out who can unzip the code for developing the desired set of digital skills for the future. One assumption is that staying in forefront of the digital development will secure the promises and hopes produced by the EU and OECD.

Bennett et al. 2008 summarize the claim s made for the existence of a generation of ‘digital natives’ as based on two main assumptions:

1. *Young people of the digital native generation possess sophisticated knowledge of and skills with information technologies.*

[1] http://dsc.discovery.com/tv/mythbusters/

2. *As a result of their upbringing and experiences with technology, digital natives have particular learning preferences or styles that differ from earlier generations of students. (p.777)*

These arguments are used by various stakeholders and members of the public to rush educational authorities to invest more in ICT in education. Bennet et. al.(2008) term this as a sort of "academic moral panic". A moral panic has been used to describe a situation where a certain behaviour or condition seems to threaten the social stability, values and norms. The "moral panic" of research into media education alarmed the public to become more critical of children's use of educational media. In higher education there has been "moral panic", historically, about the low quality of distance education courses and the use of educational media. This panic is now inverted: how fast should and could higher education employ new educational technology to avoid falling behind in the international competition? The discourse produces a set of binary distinctions: "new generation or old generations, technically capable and inclined or technically challenged; and finally between students and their teachers" (Jones 2010). Bennet et.al. relates these changing discourses to the increased call for educational reforms that can be found in the literature about the "Digital native". Based on the assumptions above they put forward strong demands for new ways of teaching with simulations, games, wikis, podcasts, problemsolving, collaborative learning and a host of fancy web 2.0 applications, like Second Life (Skyttermoen 2008).

2 The panic and the native

The moral panic has two sides. One connotation is the notion of the native as a person undisturbed by the social forces of society and wholly natural to its surroundings. This phantasm of the native was nurtured by Rousseau, who based his essay on upbringing on reports from the Jesuits and their self-proclaimed successes and experienced difficulties in decoding the Hurons of Canada. The native in this context is the superbly natural person, optimally adjusted to his/her natural surroundings, morally sophisticated and, hence, a profound noble savage (Nordkvelle 2004). This understanding of the native directs the panic towards the authorities and conservative forces of the educational system: can we change quick enough? Writers like Tapscott (1999) and Prensky (2010) are central in this understanding of the native and demand a radical change of education. But also educational philosophers like Burbules and Callister jr (2000) claim that "...computers and Internet have become so dominant elements of popular culture, that students simply expect teaching in higher education to be exploiting these media". Enthusiasts, or "Boosters", as Bigum and Kenway (1999) name them, consist of a variety of observers, activists and researchers.

The other side of the panic about the native, is that how perfect an expert of his/her own natural surroundings he or she may be, they would be unknowing of the world outside the realm of her/his natural habitat. In Neil Postman's perspective children were "amused to death" (1986), and the media culture has a long tradition of being deemed detrimental to a sound upbringing (Critcher 2008). The opinion that young people spend too much time with media, using it for entertainment rather than for learning, is commonly held. Teachers in Norwegian higher education consider badly prepared students as their strongest challenge (Haakstad 2010). Dropping out from school and failing exams are often attributed to extensive use of media, gaming and the "lure" of the pleasant and unchallenging (Ito 2008).

Both versions of the "native" have significance in this context. The first one carries the connotation that children brought up being natural to digital technologies will fulfil the utopian ideas about a new personality that is perfectly networked, immersed by games, simulations and software that are deemed functional for a new society – also called the ideal of the "boosters". The second version raises our suspicion that the native also in fundamentally ignorant about the world outside his/her realm, and has potential for loosing track with the ethical, social and cultural – or the worst case scenario of the "debunkers" (Holloway and Valentine 2001).

Where one group finds good reasons for moral panic, another group see "the new" as a saviour and future hero. This echoes former discourses sociological concerns about "the lonely crowd", the "narcissists" of German psychoanalytical Marxism of the 1970/80-ies (Ziehe 1975), of various post-Postman (1985) concerns about how kids amuse themselves to death. And subsequently they mirror larger concerns about how globalisation affects the psychological structure the modern/postmodern human beings. "The motivational structure" of children of the West has probably changed in the direction of "feeling good, doing bad". The recent media interest of the book by the Yale law professor Amy Chua *Battle Hymn of the Tiger Mother* (2011) raise questions of the mediocracy of white, sedate and bored who have lost the meaning of the struggle for the global hegemony.

There are several discourses involved in this development. There are arguments of an instrumentalist type, and there are existential and philosophical arguments. The instrumentalist argument addresses the future competencies of the workforce and the need for keeping up with the competitors in the globalisation race. The latter type suggests that the matter of being in the world is so heavily influenced by digital technologies (and other sophisticated technologies) and that it raises a continual debate about what **being** in this context mean with necessity (Burbules & Callister jr 2000, Løvlie 2003, Dannelsesutvalget 2009, Kellner 2001).

3 ICT in higher education and the digital native

Burbules and Callister jr. (2000) suggested these five reasons why higher education should explore the potential of educational technologies to a much higher degree:

1. *the high quality one-to-one teaching in higher education is definitively history (although some elite institutions may still maintain it)*
2. *University students are privileged and education has far better chance to become democratised using ICT*
3. *Computers and Internet have become so dominant elements of popular culture, that students simply expect teaching in higher education to be exploiting these media*
4. *Higher education needs to become involved and set standards for what critical and reflective use of educational technology can be*
5. *Under certain circumstances there are exciting possibilities for increased student interaction and pedagogical experimentation and variety.*

Burbules and Callister jr. foresaw that future students would be expecting higher education to deliver high quality material and challenging digital learning environments. They feared these students would seek out new ways of achieving their education, regardless of their formal status. A recent informal group of activists, "The Edupunks", coin this trend by suggesting that self-directed learners are able to navigate themselves through courses offered online and in open access[2]. Jim Cross[3], who introduced the term, realises what Burbules and Callister jr. foresaw in 2000, but in an importantly different manner. Their anticipation would be that ".. other institutions, more baldly commercial in nature, will step into the vacuum and offer the courses and degree programmes online that students are demanding" (Burbules & Callister jr. 2000, p. 3). The "digital native" Jim Cross has depicted the dream of all teachers: the self-directed learner, but a profoundly illoyal one: - who cruises up and down the road irrespective of where the relevant teaching is offered. The "threat" posed by this behavior is obvious. The Market will get the better of us in any of these scenarios.

3.1 The empirical native

There is now a more diversified discussion about the digital native than initially was the case. Krause (2007) reports from a study of first year students in Australian. She claims their understandings and experiences of educational technology vary significantly with their socio-economic background, gender and age. Bayne and Ross refer to a recent study which claims that while use of internet technology, particularly for social networking, is almost ubiquitous among 16-18 year olds, this does not translate into a desire among this group for more technologically-focused approaches to teaching and learning at university. On the contrary, 'fundamentally, this age group suspects that if all learning is mediated through technology, this will diminish the value of the learning' (Bayne and Ross 2007, p 2). Jones & Cross (2009), summing up a number of similar studies, support the notion of a diverse pattern of usage, and that the field is still in a state of moderate change. Scanlon (2009) suggest that the reason for the hype is of three kinds: class, commercial interests and confusion. Those observing the phenomenon represent elite institutions (like Harvard and their professors Palfrey and Gasser (2008)). Prensky makes his living from selling sophisticated gaming products, and the confusion arise from the assumption that students who juggle their cellphones, iPod, computer and twitter along are actually using technology on a sophisticated level. According to Scanlon, this is false. Teaching in a journalism programme at LaTrobe University he argues:

[2] http://www.downes.ca/cgi-bin/page.cgi?post=44760
[3] Not to be confused with Jay Cross, who first suggested the term "e-learning".

> *Those writing about digital natives confuse the ability to navigate around ready-made online environments or download content from the net for a general ease with technology. From my experiences in the computer lab, once students stray outside of the safe confines of pre-built, pre-configured online environments provided by the likes of Hotmail or Facebook, they often turn out to be just as confused as the rest of us.*

Along this line of argument, the threat of the digital native is that they are too unknowledgeable of the use of ICT and that those students who are less interested will be neglected or select studies where demanding use of ICT is not usual. This means that students will be captured in the "digital divide" and we may face a situation where the variation within the generation of digital natives is more significant than the possible gulf between the "generations" (Bennet et al. 2008: 779).

The claim that the "new learners" have developed advanced learning styles and skills is also strongly contested. While the assumption that young learners were skilled in multitasking, recent research contradicts the assumption that such abilities are beneficial for learning (Ophir, Nass & Wagner 2009). Research on student learning styles, suggest there are several styles involved, and that students can adjust to a variety of learning situations. What can be said is that conventional academic teaching might have rewarded some learning styles more than others. In any case, the assumption that a whole generation has acquired one specific new set of learning style has not in any way been substantiated (Op.Cit. Bennet et al.). Informal use of ICT has a strong gendered bias. Boys are reported having a much higher use of gaming, while girls report a much higher degree of use of cellular phone for the purpose of making contacts locally, with friends, primarily (Watten et al., 2008; Puijk, 2004 & Enochsson, 2007). Norwegian and Swedish students in lower secondary use cell phones and/or Internet for the purpose of strengthening local networks instead of global networks. In Norwegian Media Barometer (2010) boys in the age group 9-15, 39% had used videogames on an average day, while only 11% of the girls in the same age span had used it.[4]

One assumption is that leisurely activities provide learning opportunities for students that are rarely used in teaching. Digital game play is for instance a common activity for US teens (Lenhart et.al 2008). Games are seen as very academically encouraging, particularly for the bottom third of students (Dede, Ketelhut & Nelson (2004). In Scandinavia the assumption that students acquire competencies for learning with media that schooling could benefit from has gained substance (Bjørgen 2010). Findings from the OECD study indicate, however, that this is a rather complicated trajectory (2006, Hatlevik 2009). In certain areas, such as writing skills, findings from a recent study indicate that students benefit from dating on the Internet. To find partners, they need to develop a language of emotions and building of trust, - skills that are essential in "creative writing" (Fritze and Nordkvelle 2007). These findings illuminate a major finding from the metanalysis: "Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies".[5] The report show that the inclusion of more "fun" stuff like quizzes or video did not result in more or higher quality learning: "Inclusion of more media in an online application does not appear to enhance learning". However, what made a difference was the time spent on learning activities. If high quality video, quizzes or gaming contributes to make students work more and harder with their studying, a higher learning outcome can be expected, or at least one can hope that elements of edutainment can provide such elements.

Most students claim they will learn more from having podcasts available. In a metastudy by Hew (2009) eight reports using self-reporting claim there are positive learning results from using podcasts. Students do appreciate the availability, potential for repetition and stop/start/rewind-options. However, studies using quasi-experimental designs show no significant differences between students using podcast and those who don't. "Time on task" is possibly the most important variable. Based on data from 84 self-reporting students Copley concludes (2007):

> *The learning outcomes evidenced by the survey of students presented here include facilitating better revision and preparation for assessments, allowing students to engage with concepts*

[4] http://www.ssb.no/medie/sa121/spill-tekst.pdf
[5] (http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf).

> *during lectures rather than note-taking and providing opportunities for students to assimilate complex information at their own pace (s. 398).*

In the ECAR study one student reported the relief by having the network collapsing at the dorm for a while, so he finally could find time to do serious studies (Salaway et al. 2008). Numerous reports of students missing classes and failing to complete coursework signify that the temptations of gaming and social networking are too strong for some students. "The disappearing student" has become a source of worry for many academics, assuming that making teaching available as podcasts, streamed video leads to less engagement with teaching on campus (Massingham and Herrington 2006).

3.2. Measuring competencies of students and lecturers

Over the years a number of taxonomies have been suggested to estimate levels of competencies students and teachers have obtained. Information literacy, ict literacy or media literacy are conflicting and alternating terms used (Vitolo & Coulston 2002, Markauskaite 2006). Measuring the skills of students in the area of mastering computers and educational media is a rapidly developing art (Varis 2008, Erstad 2009). Since 2007 all US schools need to report their level of technology literacy for their eighth grade students (Hohlfeldt, Ritzhaupt & Barron 2010). A government financed research institute has performed such studies since 2003 for Norwegian schools, with the most recent study from 2009 (Hatlevik 2009).

Most studies of this kind are based on self-reporting. The evident problem with this is the notorious discrepancy by the stated and the observable competence (ibid). There is an ongoing debate on how to operationalise and refine measuring instruments to reduce this gap.

The International Society for Technology in Education (ISTE) has, in their «The National Educational Technology Standards for Students», pronounced six areas to assess when mapping digital competencies in education in general[6]: *Creativity and Innovation, Communication and collaboration, Research and Information fluency, Critical Thinking, Problem Solving, and Decision Making, Digital Citizenship and Technology Operations and Concepts.* Similarly they have designed a five issue table on standards for teachers: Facilitate and Inspire Student Learning and Creativity, Design and Develop Digital-Age Learning Experiences and Assessments, Model Digital-Age Work and Learning, Promote and Model Digital Citizenship and Responsibility and Engage in Professional Growth and Leadership[7].

These areas of expertise are vast, and are complicated to align with the various content areas teachers need to master. A model for assessing teachers in primary and secondary schools: TPACK, builds on Lee Shulman's conception of the Pedagogical Content Knowledge. The added T adds the "technology literacy" as a new dimension to their pedagogical and content knowledge (Mishra & Kohler 2008).

4 The ICT-monitor for Norwegian Higher Education

In the fall semester 2008, Norway Opening Universities[8] initiated a comprehensive survey on the use of ICT in their studies among Norwegian students and their lecturers. The survey comprised 5500 students in their second year of study and 1000 lecturers and teachers from about 40 different universities and university colleges. This review of the results in this paper is derived from the report issued in 2009 (Wilhelmsen et al 2009), and relies heavily on Breivik's paper "Great expectations – and small steps" (2010)[9].

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6 http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_2007_Standards.pdf

7 http://www.iste.org/Content/NavigationMenu/NETS/ForTeachers/2008Standards/NETS_T_Standards_Final.pdf

8 Norway Opening Universities is a a national political initiative for opening Norwegian universities towards more flexible modes of teaching and learning by stimulating the creative and competent use of ICT

9 The author's role to this study was one of being an advisor and critical reader of its contents, reflections and conclusions. He chairs a committee on surveying the status o fuse of ICT for teaching and learning in the NOU.

A general picture is that students and teachers use ICT a great deal, but on a basic level: internet browsers, textprocessing, and steadfast use of Learning management systems (or VLEs as is the preferred term in the UK, or "Learning Platform") for delivery of teaching material, handing in assignment and grading. More sophisticated use is rare, such as collaborative exercises or social networking.

4.1 Time spent with computer

Norwegian students use computers for private and leisure purposes 10.4 hours pr week (median 7-9 hours) while time for studying absorbs 9.4 hours (median 7-9 hours). Students use the computers more in their homes, than on campus. The survey revealed that computers are not much used during lectures and lessons, only 1.9 hours (median less than an hour). In sum the mean student use ICT 21.7 hours a week. Norwegian lecturers prepare lessons as well as perform scientific work with computers abundantly, but rarely use them for teaching, or for blogging or participation in public debate (there are 1000 blogs about knitting, but only 20 academics maintain blogs (Larsen 2010).

This survey did not measure what students do when using computers for private and leisure purposes, or how leisure and private activities intertwine with studying. Some studies indicate that working with learning objects or podcasts constantly blurs the border between the two areas, and that the use of laptops in class often takes students into private or leisurely activities (Røise & Leiknes 2007). From other surveys we know that use of social networks is common, and that Norway has one of the world's highest rates of Facebook members per capita.

In comparison, the ECAR study 2009 from USA shows that the students use ICT on an average 21.7 hours a week. 8.8 % spent more than 40 hours a week in front of computers. Engineering students spent most time (mean 24,9 hrs.) while education majors spent least time (mean 19) (Smith et al 2009).

4.2 Communicating with students: Does e-mail work?

E-mail is one of the most frequently used means of communication among academic staff. Almost all teachers and lecturers use email weekly (97 %) and most of them daily (3 of 4). This is rather stark contrast to the students. More than half of the students use e-mail less regularly than weekly (only 48 % use e-mail weekly, of them only 9 % daily). Students prefer text-messaging, instant messaging and social networking software. However, a great part of those who use e-mail rarely, are also infrequent users of other digital communication tools. This in line with Jones' findings from the UK (2010) and the ECAR study. The use of E-mail is apparently a signifier of older people's use of ICT.

4.3 Information search on Internet

Both students and lecturers use Internet browsers extensively to obtain information from common sources like Google and Wikipedia. Even if teachers are concerned about the reliability of Wikipedia and information retrieved by students on the Internet in general, they consult Wikipedia more than students.

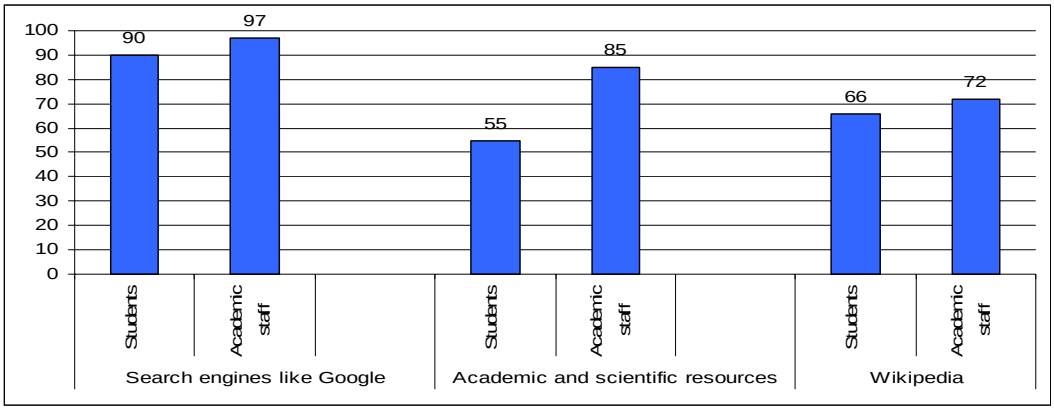

Figure 1. Students and academic staff's use of information sources on Internet. Monthly use. Percent.

4.4 Use of presentation programmes

PowerPoint or similar are widely used by lecturers – and they make their presentations available for their students. Internationally, the question has been raised if this leads to students failing to show up for lectures, and, secondly, if a presentation in itself has any educational value on its own (Massingham and Herrington 2006, Kjeldsen 2006). This survey indicates that access to presentations from lectures is highly valued by the students, and they report that such access does not have any effect on their habit of attending lectures. This result is in contrast to the beliefs of their lecturers and higher officials. Even if lecturers use it extensively, they don't require that students use it. Accordingly students in HE use these programmes far less than students in secondary school, as supplementary data from a parallel study of primary and secondary school show (Arnseth et.al 2007).

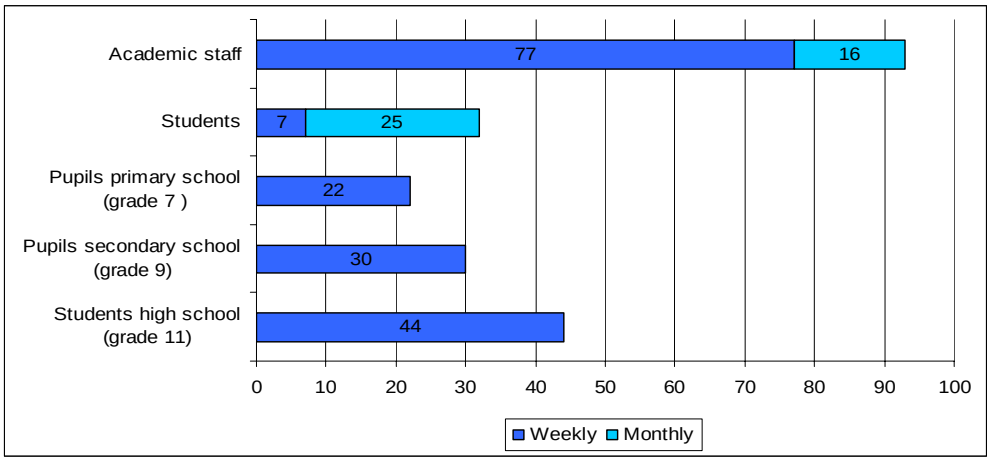

Figure 2. Use of presentation programmes (like PowerPoint) among students, academic staff, pupils and high school students. Weekly and monthly. Percent.

The use of PowerPoint is highly discussed among academics, but relatively little research is done on its use. On the other hand, the ECAR study indicates that US students use presentations more frequent in their studies. Used in a reflected and advanced way, presentations can support student's learning in a variety of ways (Clark 2008)[10].

4.5 Interactive tools: Blog, wikis and discussion forums

Our survey found that such tools are not common as learning tools in Norwegian higher education. Less than 10 % of the students report that they use such tool for educational activities. Norwegian statistics show that 13 % of youth and children below 18 years would write a blog on a regular basis[11], and this figure is rapidly diminishing because Facebook and Twitter apparently fill some of the needs that Blogs used to do. Using social software is reported to be used extensively, but has only recently begun to be raised as challenge to teachers in higher education (Nordkvelle 2007).

4.6 Learning management systems (LMS)

In addition to basic tools and information search on Internet, LMS' are regularly used tools for study purposes. About 85 % of both students and academic staff report that a LMS is used in their study programme. Basic functions are most used, both by students and academic staff.

[10] The ECAR survey has measured American students use of presentation programmes, and report a frequent use
[11]

http://www.medietilsynet.no/Documents/Trygg%20bruk/Rapporter/Barn%20og%20digitale%20medier/100319_Del_2.pdf p.15

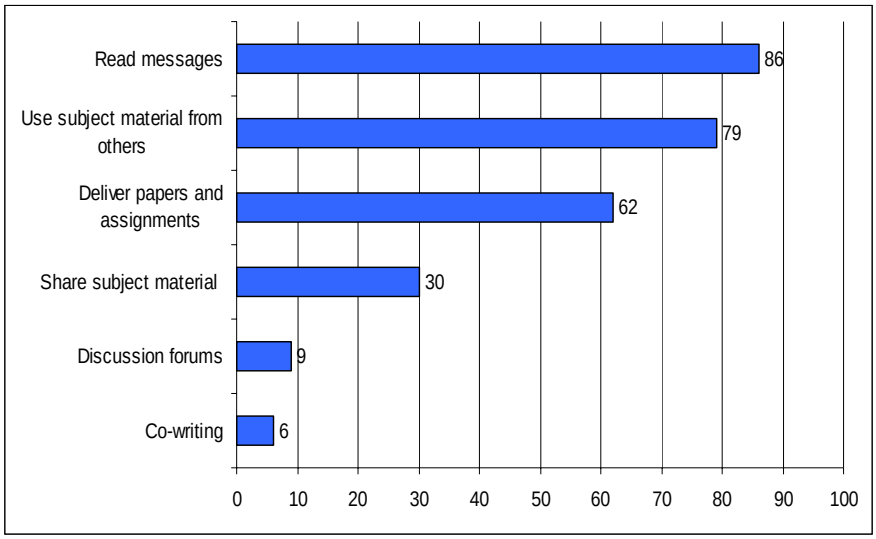

Figure 3. Students use of LMS functions. Percent.

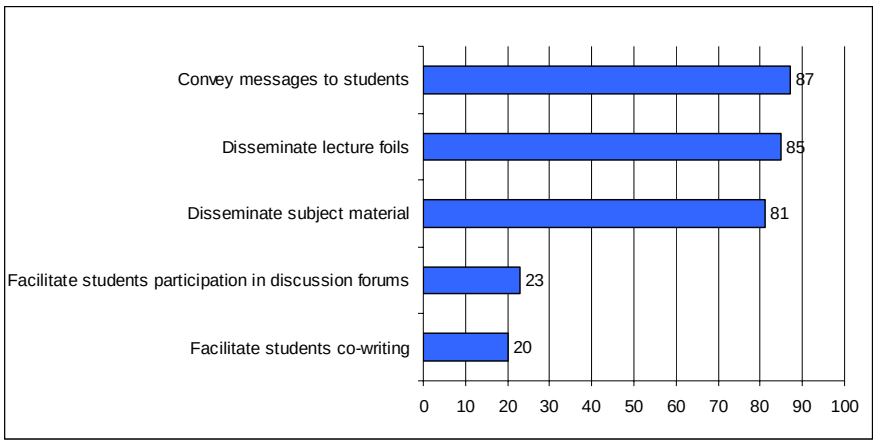

Figure 4. Academic staffs use of LMS functions. Percent

The main reason given by many higher education institutions for implementing a LMS is, according to Coates, James and Baldwin (2005) is that it promises a more effective way of teaching, particularly by means of delivery of educational material, reduction of cost to rooms, seminars, more on-line testing and less examination etc. Second, the LMS are marketed with a promise that students will learn more and better: multimedia can supply more comprehensible material adjusted to a wider range of learning styles. Third, students expect to have access to computers and software that is industry-standard as a preparation to work-life. This argument has lead to a strong competition between higher education institutions on presenting the most modernist and chic version of a virtual component in university life. Implementing an LMS has also made it easier to offer courses to a wider audience, as part of a more democratic lifelong-learning strategy, which means increasing student enrolment. And last, but not least, LMS can fill an important role as to create order out of seemingly chaos in higher education institutions:

> *LMS may appear to offer a means of regulating and packaging pedagogical activities by offering templates that assure order and neatness, and facilitate the control of quality. The perceived order created in teaching and learning by LMS is, we suspect, one of the more persuasive reasons for their rapid uptake. (ibid p.25)*

The widespread use of LMS indicates that both students and academic staff find the LMS useful. Though, it seems like the use is based on basic functions, and largely connected to administrative purposes. Teachers who offer presentations to students on the LMS get a quick and easy confirmation of having gained a level of digital sophistication. This is what makes the LMS conserve established ways of teaching, according to Zemsky & Massy (2004)[12]. There are few incentives for teachers to become more sophisticated users (Vrasidas 2004).

The LMS seems to function more as bulletin boards than as powerful tools which stimulates to more student activity or student orientated learning. However, there is nothing that indicates integrating of ICT has been slowed down by the LMS-approach. Rather, it seems like the LMS has been an initial step, and that time may have come to focus on other applications. A call for LMS/VLE 2.0, which able to incorporate social media, blogging, production of wikis as integral to the standard activities and protocols has been made (Nordkvelle 2007).

4.7 Does age matter?

It is a common belief that older staff is more reluctant to start using ICT and that younger students are more eager to use ICT for educational purposes. The survey suggests otherwise. In fact older students seem to be more likely to use ICT for their learning, according to a study by Rønning & Grepperud (2006). This is also the case in the research reported by Jones (2010). Older students use their computers for study purposes more than younger students (2,4 hrs vs. 2.0 hrs, p.16). Students who report that they cooperate more with other students seem to use ICT more and more varied than other students. There are other variations as well, connected to academic subject, type of institution etc. For academic staff there seems to be an astonishing small correlation between age and facilitation for students' use of ICT.

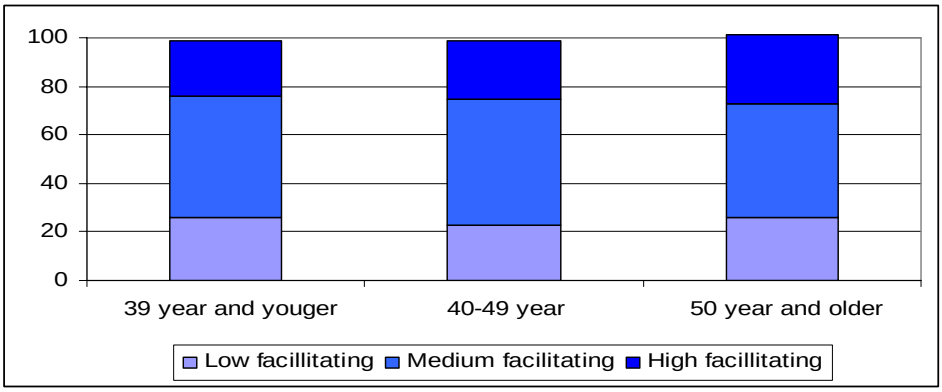

Figure 5. Age of academic staff and facilitation of students' use of ICT (based on index) Percent.

There are few signs of a new generation of technology friendly younger academics taking their place.

5 Conclusions

In this paper I have screened some of the discourses that are prevalent in the present context of implementing ICT for teaching and learning in higher education and asked if this is a myth worth busting. The discourses are linked to larger economical - on one side - and existential -discourses on the other. The moral and political issues regarding student's use of ICT are intriguing, - but not much discussed in the academic community. However, I suggest there is a general quest to explore new potential for teaching in learning, and ICT is presently suggested as the most prominent and important new arena. The "digital native" is one of the notions

[12] Robert Zemsky and William F. Massy "Thwarted innovation", claim that the use of LMS in fact hampers the development of e-learning: "A number of people are coming to believe that the rapid introduction of course management tools have actually reduced elearning's impact on the way most faculty teach. Blackboard and WebCT make it almost too easy for faculty to transfer their standard teaching materials to the Web" (Zemsky and Massy 2004).

that has played a significant role recently, and the belief that highly qualified and demanding users of ICT will swarm our higher education institutions in the near future, is also widely held in Norway.

The empirical research reviewed in the paper reveal a pattern of Norwegian students' use of technology which is fairly comparable to other Western countries. Students use ICT for study purposes and leisurely activities for more than 21 hours on average, with slightly more time spent for leisure than for studying. Most computer time is spent at home, and the computer is rarely used in classes. In general these figures are similar to findings from the UK and the US.

Students are offered teaching aided by ICT predominantly via the learning management systems (VLEs) and the tasks presented for them do not demand sophisticated actions. Downloading material and reading messages seem to be the dominant actions. More complex use, such as writing with other students, participation in discussion groups, evaluating and commenting fellow students' work, are student activities their teachers invite to less often. Advanced visual media or social media are almost not used. The ECAR-study, as well as Jones (2010), shows that students use these commodities for leisurely purposes. They don't necessarily transfer this to a desire for using similar tools in teaching and learning at the university.

The empirical results are mostly self-reported, and we need more contrasted and in-depth studies to understand why Norwegian students use some tools to a lesser degree than students from other countries, such as presentation software. We also need more specific research on studies where advanced use of ICT is a more integrated part of their learning activities. One interesting trend was that older students seemed to use ICT in more varied ways and with slightly more sophistication than younger students. It was also interesting that the age of the lecturer was of little importance, and that other factors are more important for the level of use of ICT for teaching.

Internationally, there is ongoing research which shows up a more finegrained picture of the "digital native". There is very little evidence that can substantiate the claims from Prensky, Tapscott, Burbules and Callister jr. etc.. In the Norwegian survey we found that students use presentation tools less than in upper secondary education. In general, very few would take this as a worry. We also saw that older teachers were as quick as the younger to adopt new technology.

The two sides of the panic has been discussed, and it appears that challenging young users of ICT do exist and that their presence and use of media is worthwhile studying. But they are not so many, and it is very unlikely that they have developed neither multitasking, new learning styles, nor sophisticated computer skills. In that respect the myth of the digital native has been busted. The changes are slower than anticipated by exponents of the hype. Burbules and Callister jr. suggest that there is an obligation by university teachers to investigate what new educational technology has to offer. It may be risky to investigate the promises they offer, but some of the risks are very promising (2000). It may well be that the role of higher education should be to cater for training of skills and competencies for the average and less competent users, and engage the more competent as developers and inspiring participants for the teachers in higher education.

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Conference Papers

Themes and Topics

Play and Game-Based Learning

Pedagogical Models

ICT and Mobile Technologies in Teaching and Learning

Virtual and Simulation-Based Learning

Personal Learning Environments

Social Media

Play and Game-Based Learning

Building a Community of Musical Practice for Children in a Child-centered Way – JamMo Singing Game for 3-6 Aged Children

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The UMSIC - Usability of Music for the Social Inclusion of Children project was established as an IT collaborative project funded by the FP7 program by EC for 2008-2011. UMSIC is developing the JamMo (jamming mobile), a time- and place-independent system that provides an interactive environment for musical creativity in order to promote social inclusion of young children aged 3-12. JamMo is intended to all children but especially children who are at high risk of marginalization: i) children with social, attention or emotional disorders and ii) children with newly immigrant status. JamMo applications have been designed to have an easy access to the technology children are familiar with. Since now, JamMo for 3-6 and 7-12 singing and composition games have been implemented and qualitatively evaluated in target groups both in UK and Finland. In this paper we focus on the development of JamMo singing game application for 3-6 aged children. We aim first to describe the pedagogical and technical framework of the game. By highlighting the child-centered approach we concentrate to the design of the game both theoretically and by the participatory design method that was applied in working with children aged 5-6 in the early childhood context. In describing the participatory process in practice and the gathering the research data in Finnish nurseries during 2009-2010, the iterative nature of the work will be especially noted. Finally we discuss on the importance of the child-centered approach in game development in general and open some future perspectives for the JamMo.

Keywords: child-centered approach, OSS principle, participatory design, early childhood, singing game, community of musical practice

1 JamMo Design Background

The UMSIC approach was, while starting September 2008, first widely presented in AAATE 2009 conference from the inclusive perspective of it (see Fredrikson et al 2009). As an eInclusion project (http://www.umsic.org) the UMSIC has emphasized in designing the JamMo -jamming mobile system on those special features that prevent exclusion of young children. As music is expected to be the creative source of enabling the social inclusion in time- and place independent system, papers have been published to reveal the pedagogy of children´s mobile music making (Paananen & Myllykoski 2009; Fredrikson, Iivari & Tikkanen 2009). By adapting the touch screen target device the researchers in information sciences, Human Computer Interaction (HCI) and music education have faced many challenging questions during the JamMo development work. The JamMo scenarios cover three different types of mobile music making: singing, composing and improvisation. In this paper we concentrate on the singing game design development and evaluation, especially on the user interface (UI) for the youngest age group 3-6.

Pedagogically, JamMo 3-6 singing game is made for young children´s free explorative play; it does not include direct plans. In general, children are expected to learn by playing and imitating. In JamMo 3-6 children can choose a song from the song menu to sing along with the inbuilt backing track and the adult background singer. Singing will be automatically recorded without the background singer. A mentor in a feature of a teddy bear appears and gives spoken instructions how to proceed in the game view. All other information is nonverbal. Children can play back their singing and choose if they want to save it. All the saved songs will be stored in a cupboard where they can be listened one by one by children´s own choice. Inbuilt song material is copyright free, and carefully selected to the song menu to suit children´s developmental age. Children can choose a different language for the songs. These activities are supposed to be enjoyable, intrinsically motivated, and controlled by the players themselves. We expect that children blend movement with singing to be kinaesthetic active. (See e.g. Marsh & Young 2007, 289-290.) Children have an easy access to the functionalities of the game with a technology already familiar for them. They can play alone, or together with their peer or a family member, by following the instructions by the teddy bear in the game.

Technically, JamMo is a mobile application running in Nokia N900 device (www.nokia.com/n900). It utilises the recent progress of smart phones in terms of programmability and user interfaces. N900 was released in 2009, and represented the latest technological achievements of that time. It has 3.5 inch touch-sensitive wide-screen display with high resolution, high quality audio capabilities, as well as enough processing power and memory to run diverse applications comparable to those running in desktop machines. It provides also hardware-accelerated graphics. Thus, the device was a good reference to benchmark what the current and future mobile phones are capable to achieve.

From application developer's perspective, the Linux-based Maemo operating system in N900 is very similar to any other Linux system. It has full versions of most libraries providing, for example, networking, multimedia processing, and data management. Actually, most of the time JamMo is developed in desktop computers running Ubuntu Linux, and compiled and installed in the actual device only from time to time. This approach also facilitates portability, which is also considered during the project. In future, it may be possible to use JamMo in other mobile platforms also. However, the limits of N900 (and thus other similar mobile phones of its generation) have become apparent. The complex processing of audio data, such as simultaneous decoding of compressed music, addition of effects and mixing is limited to only couple of tracks. In addition, the fancy animations that are used to accomplish more appealing user experience must be switched off when playing or recording. Naturally, more recent and powerful devices will provide more possibilities in this area, but currently we have to accept that the selected technology still sets constraints to design.

The JamMo development is based on open source software philosophy. Typically, open source software (OSS) is defined using licensing term. According to Open Source Initiative, OSS must be available in source code form with a license that permits users to study, change, and improve the software (Open Source Initiative 2004). In addition, JamMo project is organised around public distributed software development environment enabling not only transnational research consortium to cooperate but also anyone to participate. In that way, it is ensured that the results are not leaved behind when the research project ends, and also made possible to technically oriented users to enhance and adapt the software.

The UI and many operations of JamMo are implemented with declarative language describing *what* should be done instead of *how* should it be done. The functionality of JamMo can be even altered in the device by editing simple text files. This approach differs from the mainstream, but seems to become more common. It has already manifested advantageous, because JamMo has been tailored for a specific environment by a non-developer.

2 JamMo UI Design and Evaluation – Theoretical Background

2.1 Child-Centered Approach

JamMo design and evaluation relies on numerous disciplines, i.e. on music education, information processing science and HCI, each of these proving an own perspective to the process: music education offering the theoretical background and motivation for the application as well as its pedagogical design, the information processing science providing the technical solution as well as the open source development approach and HCI research contributing through usability design and evaluation, and by relying on and advocating a participatory, child centered approach in information technology (IT) development. This section will focus on the last issue, i.e. on the work of HCI specialists in the project.

In the HCI field the importance of users has been recognized since the birth of the discipline. Cooper and Bowers (1995) claim that HCI research has been postulated as necessary since it 'represents the users' - an ignored group in systems design and computer science and through the 'rhetoric on representing the user' HCI research has legitimized its existence, altogether. In HCI research the emphasis has been on HCI specialists work related to 'understanding the user' and providing this understanding to development, while also more participation opportunities for users have been called for by some researchers, maintaining that users should be more actively involved in the development process. (Bannon 1991, Cooper & Bowers 1995, Iivari 2006.) In the IT development field there also is a long standing tradition of active user participation, within which users or user representatives have been invited to take part in IT development projects (see e.g. Markus & Mao 2004). This tradition, however, is associated with information systems (IS) research, not HCI, even though there is a considerable overlap between these two research fields, both addressing issues connected to IT development and use.

The interest in children as a significant user group of IT solutions has also emerged, and the HCI researchers interested in children as technology users have also started to support children's participation in IT development (Druin 2002). Children have been invited as testers, informants and design partners to the development process (Druin 2002), these efforts largely relying on the strategies and methods already used with adult users (i.e. different kinds of requirements analysis, usability evaluation and participatory design methods (Jensen & Skov 2005), even though somewhat modifying those. The labels of user-centered and child-centered approach have also been adopted in HCI research in general and in HCI research concerning children in particular, emphasizing the importance of users or particularly child users. In user-centered design tradition the goal has tended to be particularly usability of the designed solutions, i.e. "the extent to which a product can be used by specified users to achieve specific goals with effectiveness, efficiency, and satisfaction in a specified context of use" (ISO 13407), usability being one of the important quality attributes of IT targeted at children as well. Next few distinctions identified in relation to these approaches are highlighted, showing those are relatively ambiguous terms even though widely used and accepted.

A critical review of IT literature on 'user-centered design' and 'user-centeredness' in IT development revealed that those are highly complex concepts that have been used to refer to numerous different things. User-centeredness has been interpreted as user focus, but also as work-centeredness, user participation or even IT personalization. IT development focusing on users as human beings with certain general skills, characteristics and limitations, can be interpreted to be user-centered if the technology is developed to suit that general 'human being'. An ideal situation would be to design technology to fit every individual user and his/her preferences and skills, however usually this is impossible. Nevertheless, the developers can still try to gain some empirical understanding of the intended users and to take this into account during development. Furthermore, for some, user-centeredness seems to equal work-centeredness: thus, users are not in the focus of attention, but users' work practices or tasks, or more general work processes in the user organization. Then the IT is built to support work (tasks, practices or processes) the best way possible, which typically entails first gaining a detailed understanding of the work in question, and thereafter carefully redesigning it. Moreover, user participation seems to be an essential element of user-centered design, most of the reviewed articles acknowledging that users should be somehow involved in development the approach to be called user-centered. Finally, user-centeredness has also been connected to personalization of the IT, in which case the IT either automatically adapts or it allows the user to adapt it so that it suits the specific user and her/his skills, characteristics and so on. (Iivari & Iivari, 2011.)

The same distinctions seem to exist also in connection to research related to child-centeredness in the IT field. There is research emphasizing user (i.e. child) focus, offering guidelines for designing for children as general human beings at specific age and stage of development (e.g. Gelderblom & Kotzé 2009) and many methods place considerable emphasis on empirical research on understanding children, their needs and characteristics and their contexts of use (e.g. Druin 1999, Kelly et al. 2006, Mazzone et al. 2010) as well as on understanding and carefully redesigning children's tasks or (work) practices that are to be supported by the IT under development (Druin 1999, Guha et al. 2004). Therefore, also user-centeredness as work-centeredness is evident in connection to children. Furthermore, a huge amount of studies highlighting the importance of child participation in the development can be found (e.g. Druin 1999, Druin 2002, Guha et al. 2004, Kelly et al. 2006, Scaife et al. 1997), emphasizing one or potentially even all the roles identified for children in IT

development (i.e. tester, informant, design partner). Finally, also IT personalization has been addressed as one issue in child-centered design approach (e.g. Garzotto & Forfori 2006).

In this research effort we rely on child-centred approach, aiming at designing child-centred usability for the JamMo application. This will be accomplished through child-centred usability design and evaluation. Child-centeredness in our project in the IT development context in our project, furthermore, means that children need to be invited to take part in the development process. Therefore, for us, child-centeredness refers to user participation during technology development. This is accomplished through inviting children as testers to evaluate the solutions produced in usability testing and paper prototyping sessions (see e.g. Druin 1999, Hanna et al. 1997), as informants to provide insights on their skills, characteristics, preferences and contexts of use (see e.g. Druin 1999, Mazzone et al. 2010), and as design partners creating new design solutions together with adult designers (see e.g. Druin 1999, Guha et al. 2004). User-centeredness as work-centeredness or as IT personalization are less emphasized in this project, even though we acknowledge that the tasks and practices implied by the IT for the child users need to be carefully designed and that personalization is an important issue for child users in connection to IT (see e.g. Benveniste et al. 2009), the project also planning to support personalization in the JamMo application under development.

2.2 Participatory Design Methods in Children and Technology

In this section the purpose is to enlighten the children's participation methods especially in the research area of children and technology. The roles (user, tester, informant, design partner) offer different possibilities to involve children in the design process (Druin 1997, 2002; Scaife & Rogers 1997). When describing the participation methods it's important to find out methods, which help researchers to involve children as versatilely as possible in the design process and especially in the role of informant and design partner.

Participatory design is an extensive approach attempting to actively involve all stakeholders, in this case end-users, children, in the design process. The concept of participatory design is based on Scandinavian IS research tradition (Bjerknes et al. 1987; Grudin 1991). Originally the concept grew out of work-related environments and the design of computer systems supporting work applications (Dix et al 2004; Bjerknes et al. 1987; Greenbaum&Kyng 1991; Grudin 1991). As Dix et al (2004) describe, another prevailing task for participatory design is to enforce collaboration between the end users and the developers (Dix et al 2004). Nowadays the concept is used widely in the context of design methods, where users are participating in the design of applications considering free time, home, education or work. (See e.g. Mazzone, Read &Beale, 2008.)

Like Mazzone, Read & Beale (2008) describe, there is no single structured way of running design sessions with user, the methods used depend on the design goals and the experience of the designer who will adapt the different tools and techniques according to each specific context. There are already a few of techniques that participants can be engaged in when working on designing products. Druin (1999, 2002), who is one of the central researcher and generator of design work with children, covers participatory design from the point of view of cooperative inquiry. This approach, specifically applied for children is a result of the development of traditional research methods like cooperative design, participatory design and contextual inquiry. Guha et al (2004) continue the idea of cooperative inquiry technique with the idea of mixing ideas founded on brainstorming. There are also several other participatory techniques like focus groups, storyboards, prototyping etc. In all methods the most important thing is to emphasize the children's developmental stage and understanding of the world as important features in participatory methods with children. For example O'Kane (2008) contributes the meaning of the play.

In this work, we have applied ideas from four different design research. In the beginning we applied methods of according to Mazzone et al (2010) being based on the methods of the Druin (1999, 2002) and Briggs (2008). We continued the same idea based on playing, drawing and storytelling. We also applied the ideas of Nousiainen (2008) including the five different involvement areas: ethnographical and observation-based methods, verbal, narrative ans drama based methods, documentation with photographs and writing, drawing, low-tech prototype creation and task modelling and game-like methods. Guha et al (2004) have brought up an interesting approach to mix different ideas together like O'Kane (2008). In the area of the design we have also combined methods from evaluation like usability testing (Hanna et al 1997), peer tutoring (Höysniemi et al 2003) and fun measuring. There is no single and structured way to carry out a design process. In chapter 3 we describe the milestones of the work with children with some detailed examples.

2.3 The Integration of Participatory Design and Open Source Software Development

The integration of participatory design methods and open source software (OSS) development methods in this research was one interesting research challenge. Traditionally OSS is produced by engineers for engineers (Benson et al. 2004). There is only little or no room for HCI experts if those are not able to convince core developers technically, for example, using prototypes or providing directly an alternate implementation (Andreasen et al. 2006). On the other hand, software companies are more and more utilizing OSS as part of their products or releasing the source code of their products and participating in OSS communities (Fitzgerald 2006), thus setting higher standards for usability. That phenomenon is changing the way OSS is developed.

In JamMo project, the existence and importance of HCI experts and participatory design was acknowledged from the very beginning. The typical hierarchical project structure based on technical merits was expanded to contain another level of roles as described in (Hedberg & Iivari 2009). The decision-making power was divided between the core teams of those two levels. The technical level of the model is based on the traditional organization of OSS projects and consists of four layers. The central part is the technical core team, which consisted of one or two members from each technical partner organisation. The next layer committers have access to the source code repository allowing them to implement planned features without restrictions. In the course of the project, there have been over 20 committers in total. In practice, there have not been external contributors offering, for example, bug fixes yet. The user layer of this level refers to users having some technical knowledge with an ability to fill bug reports.

The human level of the project structure was originally planned to be in-line with the technical level. However, the hierarchy has not been equally evident among HCI experts, and the supposed roles were mixed. In addition, the communication between the technical and the human level has been direct, and at least many small issues are handled between a developer and and a HCI expert without a need to circulate those through core teams. Actually, the most fruitful cooperation has been manifested during fast-pace iterative development when a developer has released a prototype implementation of a feature currently under consideration, and a HCI expert has been able to comment and–even better–test it immediately. On the other hand, if there have not been HCI experts available in some period of time, developers must have made too many design-related decisions by themselves resulting in eroded user experience.

3 JamMo 3-6 Singing Game Evaluation Contexts and Practice

3.1 Educational Context for the Evaluation

By adapting the socio-cultural theory in early childhood education we view children as active social agents who internalize cultural meanings through interaction with knowledgeable others in their zone of proximal development (see e.g.Vygotski 1986). The role of children´s play in musical development has led researchers to examine children´s participation in “communities of musical practice” (Barrett 2006). In these communities children are active agents in the determination of participants and the nature of the activities involved. The concept community of practice involve the communicative processes that hold between the persons and practices in these different kind of communities and the nature of musical engagement in these settings. (Barrett 2006, 261-262.) We understand the educational context in the JamMo as a community of musical practice for children.

The new childhood research appears as moving the focus from an individual child to a collaborative child (see e.g. Rogoff 1990). Learning will be anchored to the social practices and situations. In our research we count the play activities as co-learning situations where children play together with the JamMo, and, when they play alone as an auto-didactic process (see i.e. Barrett 2006). Our informants are preschool children who like to play and sing together with their peers. The culture specific features of the music surrounding them have become familiar by singing and experiencing music through the enculturation process (see e.g. Fredrikson 1994). At this age sensitivity for tonality and harmony is strongly increased. Consequently, relations between different tones and musical events will be discovered and the musical mother tongue adapted. (See e.g. Paananen 2003.) In the preschool, music is usually integrated to other activities from individual basic care situations to several kinds of group activities. Group activities may include collaborative activities with drawing and movement with music.

Musical activities in preschool are singing, listening, movement and playing. Game based activities as singing games and role games are popular and children are eager to sing along in group activities. The equality of children is highlighted: there are no classifications or quality criteria for the responses and performances of

children´s musical activities and most important is that everybody can feel happy to join them. (See Hongisto-Åberg, Lindeberg-Piiroinen & Mäkinen 1993; Fredrikson 1994.)

3.2 Workshops with the Children

The character of the whole design process was iterative. Workshops carried out during spring 2009-autumn 2010 consist clearly of four parts like stages including design and evaluation workshops. The research group consisting of HCI and music education specialists designed the process carefully in cooperation with the support of coders, designers, graphic designers and music psychologists. All shorter activities were composed of introduction, working with children and analyzing the material, including 5-16 children. The workshop activities were carefully planned taking the resources of the upcoming software and the mobile phone into consideration. The most important thing was accounting the ethical issues in all work with children and the naturalistic setting of the research.

First stage cleared out the children's conceptions of music and the device to the preliminary paper prototypes of the music game. The second stage was concentrating on the singing game UI and the drawing of pictures for the songs with additional testing and evaluating the earlier designed ideas with children. The third part was clearly technical consisting only of usability testing with the preliminary version of the actual JamMo game. The purpose of the fourth part of this process was to evaluate both the game and the musical material of it.

After the introduction the first stage consisted of three design workshops and paper prototype evaluation workshops. The character of these design activities was both contextual and content sensitive (see eg. Mazzone et al 2010) and the goal was to create a preliminary version of the music game through paper prototypes. In a workshop a video where three children were playing an invisible musical device was shown to stimulate children to design and build an instrument from suitable art and craft materials. This workshop was an inspiring start for the whole design process. Children continued with the tasks, listened the music in the background and produced interesting UI ideas (starting door). In addition, children showed their ability to produce UI material to the ready chosen UI backgrounds. They could connect different sensations to the pictures and create a musical soundscape for the given surrounding. This section ended up with three evaluation workshops with paper prototype versions of the game.

The second stage concentrated on the singing game and the purpose was to specify the requirements in creating UI pictures with children based on the JamMo musical material. This section consisted of creating UI pictures, evaluating UI pictures and a paper prototyping. In an iterative process children could evaluate the song icons and test the paper version of the game through playful methods. The research group discovered children's ability to produce material even directly to the UI. In the careful iterative cooperation three additional workshops for drawing and creating UI pictures were organized. In the next activity the song icons which were created by the graphic designer and the functionality of the new version of the paper prototype were evaluated by the children. With help of a story children familiarized themselves to the play activities. In the "detective agency" children got tools for the song icon evaluation task. Extra exercises for testing the improvisation part of the game showed the children's enjoyment to play with their voice and their ability to improvise and invent music. At the end of this stage the first version of the actual singing game was coded and programmed.

The third stage was purely based on usability methods and the purpose was to test the first programmed versions in the upcoming smart phone with children. The testing mainly carried out by the children and HCI specialists. They collected well functioning details of the game by observing. Usability problems were found in all the different levels of severity. Methods in usability testing were heuristic evaluation, pilot testing, and the usability testing in the field like thinking aloud, observation and interviews. Finally, the fourth stage consisted of evaluating the whole JamMo preschool children material. Especially the musical material was evaluated. Even some immigrant children participated on the evaluating workshops. Another perspective of the research was the social inclusion, an important focus of the whole project. This stage consisted of a questionnaire concerning social inclusion, usability testing and peer tutoring where children played the JamMo together. Finally the game was superimposed on the wall as playful embodiment exercises. In addition, researchers were measuring the fun features of the game.

In conclusion, the stages of workshops in the iterative design process confirmed not only the importance of the cooperation with children, with specialists from different research areas, and careful planning but also the significance of using different participatory design methods. Researchers got plenty of important information for the future work. Through observing and discussing with children it was even possible to understand small

fixable details in the game. It was for example noted that children`s singing was not recorded loud enough. In addition, when singing together in pairs or in a bigger group, children could only concentrate on approximately three strophes of the song while the songs were having too many verses. When playing the backing tracks children were spontaneous moving and showing their positive attitude for the musical design of the game.

4 Conclusions

The research project has relied on child-centered approach, designing child-centered usability for the JamMo application, child-centeredness in this case referring particularly to the importance of children's participation in the design and evaluation processes. Children have taken part in designing and evaluating the JamMo application and its musical content. In the IT context, the project can be argued to advocate child-centeredness specially in the sense of user focus and user participation, while we acknowledge that work-centeredness and IT personalization are also important issues when producing high quality IT solutions for children - as well as for adults. In developing the software the iterative process is still going on. Meanwhile, the results greatly emphasize the importance of the cooperation between developers and HCI experts in OSS projects like this that are targeting the non-technical user populations.

From an educational point of view, we may argue that end-users like preschool children are more and more familiar with the every-day technology in the future. This should be noted in creating educational contexts. As soon as the impact analysis of the JamMo has been finalized in all extent we may expect that the music game JamMo have a promising future as a creative environment of music, as a community of musical practice, even for children who may be educationally excluded: hospitalized children, children with the need of special care and education or - children in the middle of nowhere.

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JamMo Composition Games 3–6 and JamMo 7-12: Ubiquitous Learning Environments for Children's Musical Creativity and Social Inclusion

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The present study is a part of EU FP7 UMSIC project 2008-2011, in which software JamMo has been designed for Nokia N900 Internet tablet. JamMo aims at child-centred ubiquitous music making and sharing of music. It is designed playful for children aged 3–6 years and game-based for children aged 7–12 years, including those at risk of marginalisation, such as children with moderate learning difficulties (ADHD), and children who are immigrant. In this study, a ubiquitous learning environment (UMLE) JamMo design for musical collaboration and creative music making to foster social inclusion is presented. The multi-staged design process including a summary of requirements for development and learning is described, as well as JamMo Composition Games 3-6, and JamMo 7-12, focusing in the playful and game-based features, UMLE scenarios, as well as the features of inclusive education of these learning environments.

Keywords: musical creativity, social inclusion, mobile music, ubiquitous learning environments, game

1 Introduction

In recent years, mobile applications have been developed to support children's learning in many domains from language and arts to science education. Howeover, educational mobile applications, which are based on scientific research and targeted to children's spontaneous and informal 1) *musical creativity*, such as mobile *sequencers* (Fredrikson, & Paananen, 2008), 2) stand-alone *virtual instrument playing*, and 3) music *listening and sharing* applications, are few. The present project combines all four purposes mentioned in an innovative way. The present study is a part of EU FP7 UMSIC research project 2008-2011, in which software JamMo has been designed for Nokia N900 Internet tablet. JamMo aims at ubiquitous music making and sharing of music. It is targeted to young and school-aged children, including those at risk of marginalisation, such as children with moderate learning difficulties (ADHD), and children who are newly immigrant. JamMo is designed playful for children aged 3-6 years and game-based for children aged 7-12.

1.1 From mobile to ubiquitous music learning

In contrast with traditional classroom learning, *mobile learning* is time and place independent, embracing learning outside the classroom and interactions between formal and informal learning (Sharples, 2000; Sharples, Taylor, & Vavoula, 2005). According to Sharples (2000), the tools for m-learning are portable, designed to support personal learning and retrieve knowledge, adaptable to the learner's evolving skills and knowledge, suited to everyday communication and learning and, intuitive to use by people with no previous experience of technology. *Mobility* means learners' moving in physical space and portability of technology, however, it also means mobility in conceptual and social space, when learners' attention moves among competing topics, as learners interact within various social groups (Sharples, Sanchéz, Milrad, & Vavoula, 2008). Learning is interwoven with activites as part of everyday life, as learners are constantly constructing their own learning context as a result of interaction (Sharples, Taylor, & Vavoula, 2005). Recently, mobile phones have reached a point of including interesting sensory capabilities and computational power to serve as generic devices for

musical expression, creativity and collaboration, providing possibilities to design applications for children to share sounds of their physical and digital environments, and play and compose music together.

Ubiquitous learning utilizes the tools and the environments offered by ubiquitous computing, which is defined *context-aware, adaptive* and *pervasive* (Liu, & Hwang, 2010). *Ubiquitous learning environment* (ULE) is a situation or setting of pervasive education, in which students can become totally immersed in the learning process; the components of ULE include microprocessors, server module, wireless technology and sensors (Jones, & Ho, 2004). ULE have been implemented for language and mathematics (Zurita, & Nussbaum, 2004), science (Vahey, & Crawford, 2002), and geography (Clough, 2010) learning purposes. We regard *ubiquitous music learning* as a formal or informal musical activity in varying physical and social contexts, which utilizes essentially mobile technology and pervasive, context aware and adaptive wireless computing systems. Ubiquitous music learning environment (UMLE) may include a variety of technical ubiquitous music learning settings, as described by Myllykoski (2010).

1.2 Musical collaboration and social inclusion of children

We propose, that UMLE is potentially a powerful tool to foster musical collaboration, learning, participating, friendship, and social inclusion. Peer groups provide children a sense of belonging, social identity and mutual support. In peer relationships, roles and behaviour tend toward a more egalitarian and reciprocal balance, than in relationships, which are formed between individuals of different abilities and status (Hartup, 1989), and learning is effective at the Zone of Proximal Development (Vygotsky, 1978).

To be able to compose music in collaboration, children need at least some understanding of other's intentions in social situations of music making. Young children's understanding of other people's emotions and motivations is limited: their concerns are immediate and practical, focusing on recent events (Erwin 1993). However, their interactions in general are more friendly than unfriendly (Hay, 1985). The most frequent form of 2–5-year-old children's play is *parallel* play; *cooperative* play increases with age (Parten, 1932). Children as young as 3 to 4 years of age may collaborate in music making: musical ideas arise from movement vocabulary and play potentials of musical instruments (Young, 2003). Applying Erikson's (1963) theory to the musical domain, young children require opportunities for *imaginative play*, *exploring* of musical materials, musical *expression*, communication and *turn taking* with peers.

In school years, the self-concept becomes more differentiated and includes evaluative components, as children become aware of others' psychological distinctiveness: children's self-descriptions may include references to competencies, knowledge, emotions, values and personality traits (Erwin, 1993). Peer interactions are more complex and more discriminating, along with increasing social cognition. Play activities are typically *rule-based*. Children develop the capacity to collaborate with others. Inferiority develops, when negative experiences in learning or with peers lead to feelings of incompetence (Erikson, 1963). Peers act as tutors in informal musical play activities, such as singing and clapping games at playground; typical to informal game learning is that children closely observe the more experienced models in action, employ modelling and the shadowing of musical sound and action, before reiterating the complete rendition of the game (Marsh 1999). In this age, children benefit of modelling and scaffolding musical learning, providing strategies and feedback for independent music making and conventions and rules for musical collaboration and teamwork.

A risk for children's development is, that not all are accepted in peer groups. Children with learning difficulties or newly immigrant background often experience difficulties with peer relationships. Language problems and social discrimination cause withdrawal from the peer group. Children with ADHD receive lower social preference scores and are more often rejected than their peers (Hoza et al., 2005). Peer rejection may have adverse outcomes, such as a greater risk of dropping out of school and mental health problems in early adulthood (Roff, 1990). *Peer tutoring* and *ICT-based game-like tasks* have been found an effective way to promote learning and social acceptance in children with ADHD (Greenwood et al. 2002; Mautone et al. 2005). JamMo as UMLE aims at including most features of inclusive education as pointed by Biklen (2000), Feuser (2001) and Naukkarinen, Ladonlahti & Saloviita (2010) (see Table 2, chapter 5.4).

2 Aims and objective

In this theoretical paper, we present ubiquitous learning environment JamMo ('Jamming Mobile'), which has been designed for children of 3-6 years and 7-12 years of age for individual, collaborative musical creativity to foster social inclusion. We describe the multi-staged design process including a summary of requirements for *development and learning,* and the end products JamMo Composition Games 3-6, and JamMo 7-12 as learning enviroment, focusing on structures of *playful learning* (Resnick et al., 1999) and *game-based learning* (Prensky, 2001), *ubiquitous music learning* (Myllykoski, 2010), and features of *inclusive education* (Biklen, 2001; Feuser, 2001; Naukkarinen et al. 2010). JamMo aims at supporting participation, pair-game and teamwork with everyone in the classroom and in the online community. It is multicultural, employing musical and visual cues and feedback, and adaptable according to users' mother tongue.

3 Background

In MobiKid Pilot study (Fredrikson, & Paananen, 2008), mobile software applications for young children were developed and tested. The pedagogical design was formed on the model of musical development (Paananen, 2003), and Case's (1985) IP developmental mechanism. In MobiKid, the stages of *decision-making* were represented as *polar event structures,* which in turn form *simple chains* (back and forth). MobiKid software allowed children to sing, record and playback songs, and forward the products to the server independently at home. It included the backing track and the audio track for singing. The song repertoire of the software was learned in advance in music plays school by a group of children, and independently (case study with one child). (UI) and the software design were investigated by parent questionnaires and video-observations. Children were able to work independently on the device, and the structure of decision-making was suitable for the users. They were highly motivated in singing, learning and decision-making.

4 Methods

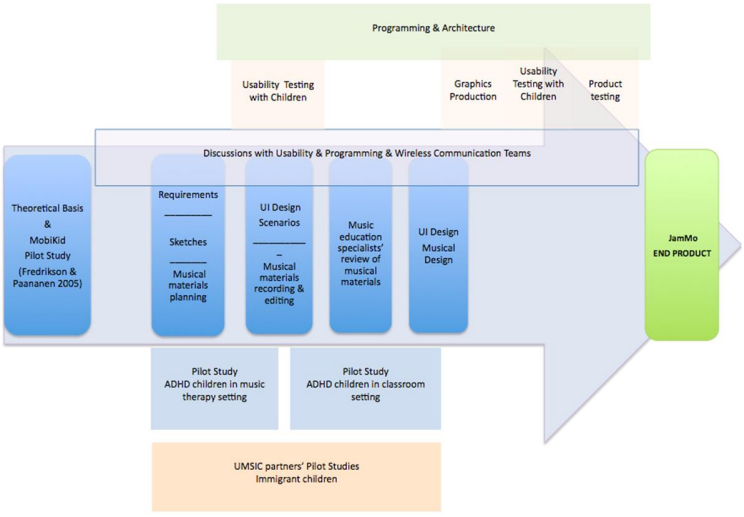

Figure 1. The study design.

This qualitative study was conducted in close collaboration with UMSIC partners. Figure 1 presents our division of work in blue colour. After MobiKid Pilot Study, UMSIC 2009-2011 project started with gathering the requirements. The music developmental basis was previously formed (Paananen 2003). According to this model of development of musical *cognition,* in the relational stage (1,5-5 years of age), children control polar relations between and within musical patterns (mental units). Musical materials of the future software JamMo 3-6 composition games is structured according to this principle. The model suggests, that in the dimensional

stage (5-11 years of age), children gradually learn to control hierarchic relations of musical event structures, such as rhythmical grouping and metre, and tonality in local vs global melodic and harmonic events. JamMo 7-12 is structured according to this principle. It includes 2-6 simultaneous tracks, as well as materials representing different syntactical dimensions of music. In addition to cognitive and musical development, requirements also included psycho-social, cultural and social domains (Paananen & Myllykoski 2009; Myllykoski & Paananen 2009). Figure 2 summarizes these requirements as implemented in JamMo design for young children's composition games JamMo 3-6, and figure 3 for school aged children's JamMo 7-12.

During requirements stage, we produced sketches for JamMo and collaborated with UMSIC usability teams to obtain ideas from children themselves, and included these ideas in our scenarios. Simultaneously, we discussed with UMSIC software and architecture teams about technical possibilities and limits of the hardware and communication. To gain more specific information about our target groups, immigrants and children with ADHD, several pilot studies were conducted in UMSIC project. These studies produced valuable information about ADHD children's specific needs related to musical materials and musical activities in music therapy settings (Saarikallio, Paananen & Erkkilä, 2010; Paananen, 2010) and in the classroom, as well as immigrant children's specific cultural needs. The present design, after usability testing and product testing, includes the music technological design, the UI, the design for social situations (UMLE), and majority of the musical materials for JamMo Composition Games 3-6 and JamMo 7-12.

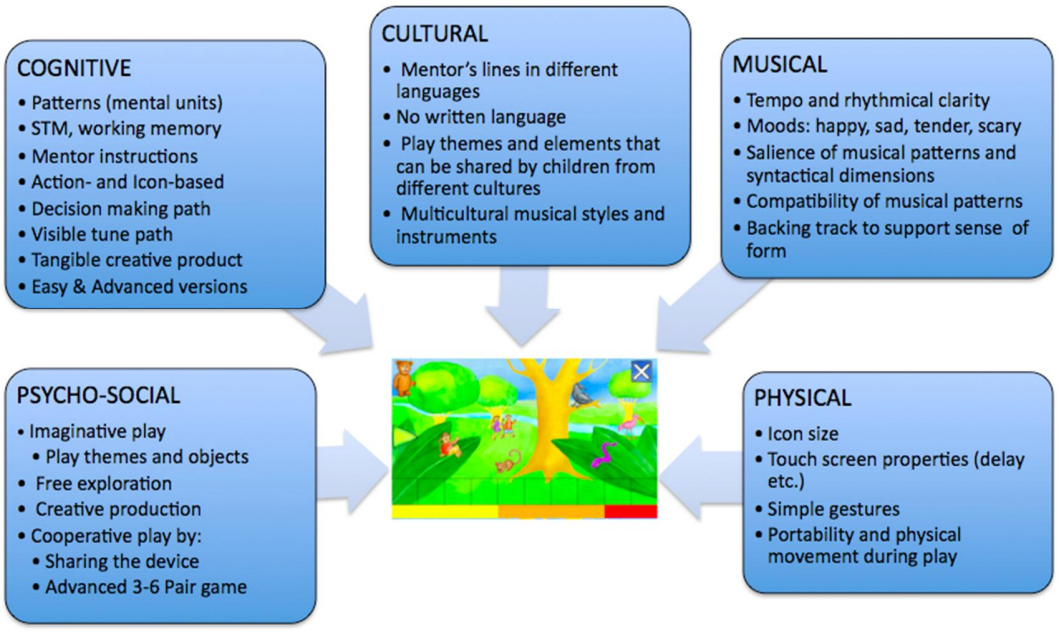

Figure 2. The requirements for child development and learning, as implemented in JamMo 3-6 Composition Games.

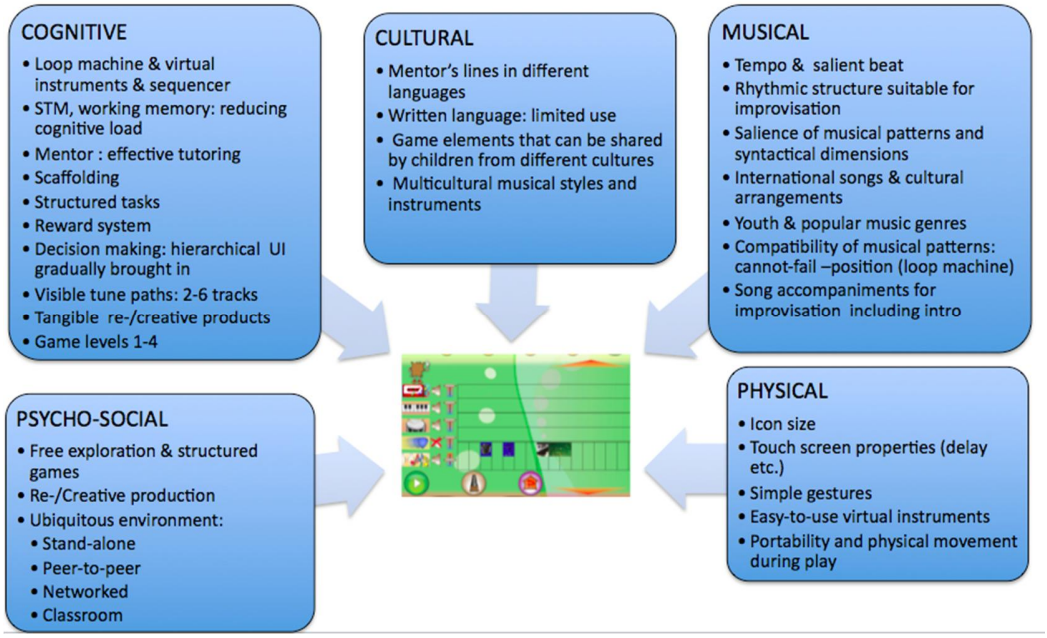

Figure 3. The requirements for child development and learning, as implemented in JamMo 7-12.

5 Results

In this section, we describe JamMo 3-6 Composition Games and JamMo 7-12, specifying the ubiquitous features and features related to inclusive education.

5.1 JamMo 3-6 Composition Games

JamMo 3-6 Composition Games are based on three play themes: Animal World, Castle and City. Visual play symbols (icons) represent musical loops in the landscape. The loops and the backing track are closely related to the visual play themes. The musical materials are multicultural including popular music genres and playful elements (ghost story, fairytale, robot, carnival etc.), which can be shared by children from different cultures. The aim of the game is to listen and manipulate loops to make a music composition. The structure of the games is a simple non-hierarchical path starting from the first and ending with the last view. The teddy mentor guides the user in each view. When the composition is completed, the product is saved in the songbank (the cupboard). Table 1 describes the game procedure and views, game objectives and learning objectives, which are classified according to Resnick's et al. (1999) categories of playful activities: exploration, imagination, collaboration, engagement, and reflection. In addition, the games include an orientation phase.

There are three versions of the game: Easy, Advanced and Pair game. In the easy version the number of loops is restricted (6 loops at a time), and there is one composition track along with the backing track per theme. In the advanced and pair games the number of composition tracks is two and the loop menu is hierarchical, and the user sees 4 play objects representing sound families. By touching a play object a pop up menu of loops will automatically appear (5 loops in each family). In pair game, the players can either be organized according to the theme, in which case the software automatically selects the players for each pair, or the players choose the pair themselves from the other children's avatars, which are shown by the program to be currently online within each of the themes. Also the teacher can group pairs via a server. Players can collaborate by taking turns to select or organize loops, or they can compose simultaneously.

Table 1. JamMo 3-6 composition game and learning objectives related to playful activities (Resnick et al, 1999).

Playful learning activities (Resnick et al. 1999)	**JamMo 3-6 Composition Game View**	**Game Objective**	**Learning Objective**
Orientation	1) The Door The user touches the door, the handle moves and the door opens. The user enters the home view.	Enter games	Start
Orientation / Imagination	2) Home The user sees 5 icons representing the composition game, the singing game, the songbank, the mentor and the door back.	Select game or listen to products	Sing, compose or listen.
Collaboration	*2b) Select pair (only in Pair game version)* *The user sees icons representing single and pair gaming.*	*Select to play single or with a pair*	*Collaborate or compose independently*
Imagination	3) Select Theme The user sees 3 icons representing themes.	Select play theme	Musical sounds & (sub)cultures
Exploration & Imagination & Creativity *Collaboration*	4) Compose The user sees a landscape, loop icons, composition track(s), mentor, playback & exit icons. The user selects and organises loops by drag and drop. *Pair game version:* *The users collaborate by composing in turns or simultaneously.*	Listen to loops and backing tracks. Add, combine and organize loops on the composition track *Add, combine and organize loops on the composition tracks together with a pair*	Perceive musical patterns and forms. Compose: combine patterns to simultaneous & successive musical events *Joint attention, turn-taking, negotiation, sharing*
Reflection	5) Songbank The user sees a cupboard with icons representing completed products on the shelves.	Listen to the compositions	Feedback

5.2 JamMo 7-12

JamMo 7-12 consists of four parts: 1) standalone orientation games; and for both standalone and collaborative work: 2) the sequencer including 4 virtual instrument interfaces (keyboard, drums, slider, jammer) and a playful loop machine, 3) the community and 4) the administrative software for teachers. Games include structured tasks, a mentor and a reward system. JamMo includes *workshop* and other community functionalities, such as sharing and discussing music and self-made music videos. The administrative software provides new kind of tools for the teacher in the public scenario of JamMo.

The virtual instruments include a keyboard, a drum instrument, a slider instrument and a jammer, which is specifically designed for children with ADHD. Jammer allows easy, motion-based rhythmic or melodic standalone or group improvisation by shaking the device in different positions. The loop machine is playful, allowing to produce 'good' and 'crazy' combinations, in addition to free exploration of individual loops. Loops are grouped according to rhythm, melody, harmony and sound/effect. Fantastic loops associating with adventurous events, the space, machines and nature are included in the repertoire, to foster musical imagination. The song and backing track materials have carefully been selected. All songs can be performed in three tempi: slower, medium and fast (90, 110 and 130-140 bpm). Intro is included the songs, to provide a cue to begin singing or playing. Loops, songs and backing track arrangements represent popular and world music genres and cultures. The rhythmic structure of the songs is clear, the pulse is salient and the backing tracks of the songs (arrangements) are suitable rhythmic improvisation.

5.2.1 JamMo 7-12 Orientation Games

The aim of JamMo 7-12 orientation games is to learn to make music with JamMo sequencer individually and in collaborative workshops, and share the products and processes in the community. The games include the structural elements Prensky (2001) has proposed for computer games: rules, goals, outcome and feedback (by the mentor and rewards), challenge (learning to make music), interaction (virtual interaction), and the representation (the musical products). The games include four different levels built on each other, including a reward system to support both intrinsic and extrinsic motivation. Scaffolding is used in the games: The first tasks are very simple, and only the necessary game features are visible and audible on the screen; along with the succesfully performed tasks, new elements appear in the screen, and their function is learned. Orientation games 7-12 encourage children in workshop –type music making. After playing all standalone game levels children have got experiences, how to create and find workshops to participate in.

Level 1 games introduce the users with loop-based composition, virtual instrument playing, and singing skills *in isolation*. In addition, the users explore and get acquainted with musical materials of JamMo and the very basic software functions such as play, stop, delete, select musical materials and drag & drop. As a reward of learning these skills, children may send their composition to JamMo Songs in the server, and move to level 2. In Level 2 games instrument playing, singing and loop composition are combined. The number of tracks increase. Users learn more sequencer functions the basic community-related functions of JamMo, such as adding the song in the communal song bank in the server, and creating a workshop for collaborative music-making. Level 3 games are mainly related to more complex communal functions such as using help desk, learning to discuss music in forum and make audio and written comments on music. Moreover, a very motivating function to be learned is how to make a music video and share it in the community. Level 4 includes the most detailed sequencer functions related to MIDI editor, and learning of recording, editing and importing new loops.

The mentor guides the user verbally and demonstrates the action in each task. The mentor also helps the user, if user hesitates which element to control, and gives positive feedback after every successful action. The user get points of successfully performed tasks, and in the end of each game level they gain new game features. As a result of playing children will produce musical products: loop compositions, improvisations, and song performances. These musical products also serve as rewards, and can be shared in the community.

5.3 UMLE: Standalone, ad hoc, networked and public scenarios of JamMo

Stand-alone scenarios of JamMo cover independent musical activities with the mobile device, such as playing 3-6 Composition Games (Easy and Advanced) and 7-12 Orientation games, exploring the 7-12 sequencer's possibilities, making music with it, and listening to the musical products in the personal songbank. *Ad hoc* scenarios operate in mobile ad-hoc networks between the devices within close proximity (Brust & Thielen, 2008); *peer-to-peer* music making scenarios of JamMo cover 3-6 Composition Game Pair Game as well as ad hoc workshops (shared music sessions) of pairs or small groups with JamMo 7-12 in the classroom or in freetime. In these workshops children can compose, play and sing music. *Networked* scenarios of JamMo include *distant* workshops, as well as discussions and sharing of music in JamMo Community. *Public* scenarios usually require a teacher server, which provides administrative functionalities (Brust & Thielen, 2008). JamMo administrative software can be used for 1) teacher-led instruction: delivering musical materials and tasks, observing and helping individual students; 2) classroom projects, such as workshops, which employ ad hoc

networks for collaboration, and 3) classroom chains for projects, such as chain composition, or non-real time side activities.

5.4 Features of inclusive education

Table 2. Features of inclusive education included in JamMo design.

Inclusive education **(Biklen, 2001; Feuser, 2001; Naukkarinen et al. 2010)**	**JamMo Design**
No language barriers	Music as communication; three preset languages; possibility to translate mentor lines
Participatory, accessibility	Mobility; games 3-6 and 7-12 (mentor, structured tasks), musical materials
Flexible teaching methods with innovative approaches to teaching aids (ICT)	Sequencer, games 3-6 and 7-12, workshops, community, musical material, administrative software
Individual differences are taken into account	Games 3-6 and 7-12; musical materials, administrative software
Scaffolding for learning is provided	Mentor 3-6 and 7-12; games 7-12 (structured tasks)
Instruction is based on scientific research of how children learn best	Games 3-6 and 7-12; musical materials
Learner is active and as a critical member of the group	Workshops & community
Flexible group size	Workshops, administrative software
Collaborative learning culture, developing friendship	Games, workshops & community
Right to learn in a peer group	Workshops & Community
Understanding diversity	Musical materials
*More than one adult in the classroom	*Interventions & educational contexts

Table 2 presents features of inclusive education and the related design functionalities of JamMo.

6 Conclusions

JamMo 3-6 Composition Games provide children opportunities for parallel (3–4 years) and cooperative (5–6 years) musical play in the form of music composition, supports turn-taking in the form of pair gaming, provides visual feedback of musical patterns and produces tangible musical products. JamMo 7-12 provides different forms for musical collaboration and social sharing as well as tools for individual and collaborative musical creativity in informal and formal settings. UMLE scenarios provide flexibility and tools for supporting individual students' learning in the educational use of JamMo. We propose JamMo UMLE scenarios can be used for social inclusion, not only of immigrant children or children with ADHD, but also children living in distant locations, 'in the middle of nowhere'. JamMo games and sequencer will be tested in classroom contexts using standalone, pair and small group composition with 10-11-year-old children (N=35) in April 2011. Preliminary results of are expected in June 2011.

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New Methodology for the Use of Board Games in the Classroom: Ekopolis Case Study

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Ekopolis is a highly innovative educational project that uses a complex board game to enhance environmental education in grades 5-9. Playing the attractively designed board game is evocative for a diverse set of follow-up activities in the classroom and on the interactive website supporting the project. In the board game, players create their own city from various buildings. The follow-up activities connect their in-game experiences with the specific environment in the cities where they live. The purpose of this article is to present the educational method employed in this project. Special emphasis will be put on the motivational and evocative aspects of the project. The article also presents results from pretesting in 19 schools, with detailed questionnaires from students as well as teachers. It concludes with a discussion of the preliminary results and the potential for employing this method in other educational contexts.

Keywords: board games, environment, motivation, environmental education

1 Introduction

Board games are one of the few remaining activities that have the capacity to fascinate children outside the online virtual world. In comparison with their virtual counterparts, board games include the element of real communication within the group of players. They also require sustained concentration and can produce the feeling of group immersion into the topic of the game. These qualities make them well suited for use in modern classrooms. Especially in situations where lack of student motivation emerges as one the principle obstacles to a more efficient learning process, board games can serve as excellent evocative exercise. When supplemented with carefully designed follow-up activities related to the topic of the game, we expect that they can significantly improve the efficiency of learning, the attitude of children towards school activities, as well as the general atmosphere in schools.

2 Aims and objectives of the paper

The principal aim of this paper is to describe the innovative methodology used in the Ekopolis project, which combines an attractive board game with a number of closely connected follow-up activities for students. The project is designed for students between eleven and fourteen years of age.

We will discuss the main assumptions behind the chosen approach, as well its strong points and potential pitfalls. The connection between the evocative board game and the diverse follow-up activities will be explored in more detail, with emphasis on broader educational goals covered by the project.

The paper also presents preliminary results from the pilot phase of the project, in which 19 schools participated. We analyzed detailed questionnaires completed by students as well as teachers who participated in the pilot. These give us confidence that the selected method has the potential that we had envisioned at the beginning of the project.

In the concluding section, we will put the results in broader context of using innovative modern educational methods. Prospects for further projects using similar methodology will be assessed as well.

3 Background Games and Education

Games are complex cultural phenomena that can assume various forms. As analyzed by Johan Huizinga, game concepts provide the underlying structure for diverse social activities from lawsuits to political contests (Huizinga 1955). Games have been prominent in education since antiquity, especially in the form of simulation of adult activities. In the early renaissance period, Comenius clearly postulated that educational content is best presented to students in the form of plays (*schola ludus*) or in graphic educational materials (*orbis pictus*).

The use of games for educational purposes is well known. According to some sources, the German Army used board games for development of strategic thinking already in the 19th century. Clark C. Abt published his Serious Games book in 1970, which pushed the conceptual thinking about games in education to another level (Abt, 1970). Even though Abt focused primarily on card games and board games, the rapid development of computers led to a number of computer games being produced that were utilized also in the classrooms. Several studies assess the results of using commercial computer games such as Civilization III, The Sims 2 or Europe Universalis II in the classroom settings. Authors of these studies confirm that placing the student within a complex fictional setting improves their ability to solve problems, cooperate on their solutions with other players and overall motivates students towards independent research on issues related to the game problems. In the end, however, the authors conclude that the use of existing commercial computer games within formal educational settings is problematic due to the lack of attention to pedagogic aspects within the games and due to oversimplification of real-life processes that can be misleading for students. This led to the development of specialized educational computer games (Gee 2003, 2007).

The educational computer games have several important advantages: they can include sophisticated game mechanisms and large game worlds. Also, players can play one game for months because of the save/load feature. However, educational computer games have important disadvantages. Especially when played by a single player on a single computer, they lack the socialization aspect. Even though some computer games are now constructed as multiplayer games, the provided social connections are still virtual. Moreover, computer games are require complex infrastructure, such as hardware, high-speed Internet connection and other requirements, which some schools may not be able to fulfill. The fundamental differences between computer and board games can be observed even in the commercial gaming industry, where both the computer game market and the board game market increase independently of each other. This demonstrates that computer games are not simply more advanced substitutes for board games.

Board games are a very specific type of games, combining several game elements as analyzed by Roger Callois in his seminal work Man, Play and Games (Callois 1958). They have several advantages that make them suitable for classroom use, especially when accompanied with adequate methodical support. The most successful modern board games like Agricola, Risk, Monopoly or Settlers of Catan usually combine elements of long term strategic goals, short term tactical objectives, an element of chance, interaction between players as well as immersion within a specific microcosm attractive for the players. The connection between the microcosm of the game and the macrocosm of the real world presents an excellent opportunity for educators to explore. We know that children enjoy playing board games, which is why they can serve as excellent evocative educational material the teachers can subsequently build on.

4 Methods: The concepts behind the Ekopolis project

The Ekopolis project is divided into three interconnected parts. The first part is intended to introduce basic concepts and terminology to students through the attractive environment of the board game. The second part is a handbook for teachers that describes in detail how to use the project effectively in the classroom. The last part consists of an internet portal where students can complete various activities and discuss their individual projects. Such structure follows the “evocation – realization of meaning – reflection” (ERR) model, which has been successfully used in various other projects (Steele, Meredith, & Temple, 1998).

4.1 The Game

The Ekopolis project is based primarily on an attractive environmental board game, which introduces basic concepts and terminology to the students. Because of the necessary simplification of the complex topic of

environmental education, the goals of the game had to be clearly and narrowly specified. They are explained in the following sub-sections:

4.1.1 Focus on a single issue within environmental education

The game design required a focus on a single issue within environmental education, as the area is too broad and complex to cover comprehensively. As most children in the Czech Republic live in cities, we decided to focus on the urban landscape and the relations of various city buildings and projects to each other. The motto of the game "We think about our city" clearly reflects this theme. Within this specific theme, the main goal was to demonstrate the key concept of sustainable development in an easily accessible form.

Looking at a city in a simplified form accessible to children, we divided buildings in the city into three broad categories: red, blue and green. Red buildings are needed for economic growth and industrial production, but are not pleasant to live nearby (e.g. coal power plant, car factory, airport). Blue buildings are residential or provide services to residents (e.g. apartment houses, hospital, school). Green buildings are usually not actual buildings, but areas of greenery meant for recreation of residents (parks, gardens, orchards). This corresponds to the economic, social and environmental pillars of the concept of sustainable development.

Players in the game assume the role of Mayors. They start each with a City hall (blue building) and gradually develop their city by adding more buildings. The game is designed primarily for four players, who place their City halls in the corners of the game board. As the game progresses, the cities become interconnected, and players need to observe carefully the development plans of other mayors. The limited space on the gameboard serves to evoke the idea of limited resources and the need for their careful use.

A straightforward game mechanism was developed to make players build their cities meaningfully. Players earn points for placing each building according to how suitable it is to its surroundings. In general, red buildings are well suited next to other red buildings, and earn negative points when built next to blue or green ones. Blue buildings are well suited next to green ones (and to a smaller extent to other blue ones as well). Similar mechanism works for green buildings as well. To clearly demonstrate the idea that in the real world unpopular red (industrial) buildings still often get built, players get extra points for them, demonstrating the income and jobs they create for the city.

Figure 1. Example of a red building from the game (*Coal power plant*)

To stress the importance of sustainable development and balanced city growth, players earn extra points at the end of a game for every red-blue-green triplet of buildings they placed during the game. This rule penalizes the strategy of placing only buildings of one color (or omitting buildings of one color). It has the effect of making the game more interesting, and it also directly strengthens the main educational goal with the focus on the three pillars of sustainable development.

4.1.2 Focus on evocation

The game purpose is to be primarily evocational, not necessarily self-explanatory. The basic game mechanism described in the previous section was enhanced by special components intended to introduce a wide range of environment-related terms and concepts. The main goal of these additional mechanisms was to introduce players to specific terms as a side effect of game play. Because of the requirement of simplicity, more detailed

explanation of the meaning of the introduced terms is designed for the follow-up activities (see section The Handbook below) rather than in the game itself.

Several game mechanisms were developed to fulfill this goal. At first we added the concept of environmentally protected zones to the game. Some places of the game board were marked as habitat of locally endangered species in the Czech Republic. Placing a building on such a space carries a penalty. However, some green buildings allow players to declare environmentally protected zones next to them. If a player manages to place the environmentally protected zone on the space with the habitat of a locally endangered species, she gets bonus points.

Figure 2. Detail from the game board with a locally endangered species in the top left corner

The concept of pollution works similarly. If a player places some of the red (industrial) buildings, he must also place a special red pollution token next to it. The pollution token counts as a red building, so it damages the potential for residential areas near it. Environmentally protected zones and pollution tokens add new elements into the game, as students can observe that in some parts of the city there is a lot of the original landscape preserved through the protected areas, but other parts are swamped by pollution tokens. This feature makes it easier to connect the in-game experiences with the follow-up activities focused on the real surroundings.

Figure 3. Example of an Event card from the game (*Composting facility*)

Event cards are the second evocational and main vocabulary-related mechanism in the game. These contain concepts relevant to environmental education that can be elaborated on in the classroom. Each player has to take an Event card of the same color as the building he just built. Red Event cards include for example smog, industrial accident, fire in the warehouse, annual bonuses for economic performance or other occurrences related to economic life of the city. Blue Event cards include various policies the citizens of the city can do to improve the environment around them. Last but not least, green Event cards contain natural phenomena such as tough winter or blizzard, as well as small-scale environmental projects that are helpful for the city. By drawing

Event cards in each turn, the students are exposed to various new concepts and vocabulary. Teachers can subsequently use them and explain the workings of the most important Event cards in real life. This feature also brings a bit more randomness to the game. It is important, as it motivates students who are not so skilled in playing games and who might be unnecessarily frustrated by their poor performance when compared with their peers (Fullerton 2008).

4.1.3. Focus on cooperation, competition and complexity

Ekopolis is offered in two basic variants working with the same underlying game system. The first one is cooperative and is meant for beginners and younger students. Different groups can still compete with one another in the classroom. The second variant is for more advanced players or older students, and it is competitive, as each Mayor on the game board wants to be the most successful.

The issue of complexity of the game is crucial especially in the educational context. On one hand, the game should model the real-life processes that the students can analyze later on. Any simplification in the game model is potentially dangerous, as it ingrains unrealistic connections in student's minds that will be difficult to untangle in the follow-up activities. On the other hand, real life processes (such as city development) are usually extremely varied and complex, and any effort to realistically simulate them within a board game would result in highly complex rules that would be difficult to learn. Ekopolis is therefore based on simple and short game play demonstrating the key principles.

Overall, the game is designed to be fun and fast to play (20-35 minutes per each game), but includes 48 different types of buildings and 60 different Event cards, which are introduced to the students in the course of the game. The concepts of environmentally protected zones and pollution materialize on the game board, which helps to bring attention to them in real life as well. By playing the game, students take full responsibility for their actions and see the consequences of their chosen building strategy. Chance plays a role in the game, which is helpful in motivating all students to participate, as with a bit of luck, everybody can win (especially with the Event cards). However, the game is well suited for experienced players as well, who can devise complex long-term strategies based on the perceived intentions of other players.

4.2 The Handbook

It is extremely difficult to design a board game that would accomplish serious education goals all by itself. Follow-up reflection including discussions and related activities and projects are therefore essential for the project as well. Furthermore, active role of teachers in the classroom is necessary for the project to be successful. For those reasons, we prepared a comprehensive handbook, which is designed primarily for teachers. Its main purpose is to make the work of teachers with the project easy as well as meaningful with respect to environmental education.

The handbook starts with basic overview of the project and the introduction of the topics covered by it. It includes a special section linking mandatory educational goals prescribed by the Czech Ministry of Education with specific elements in the game and with the follow-up activities. Teachers thus know exactly what are their students learning in which phase of the project. The handbook then describes how the rules should be explained both concisely and effectively. It also prepares the teachers for the most frequently asked questions so that they can confidently settle any disputes that might arise.

Next section of the handbook contains two detailed lesson plans. In these lesson plans, playing the actual game covers a little less than half of the allotted time. The rest is devoted to introductory as well as follow-up activities. By following the lesson plan, teachers can be sure that they have the basic educational goals thoroughly covered. Innovative teachers are advised to use these lesson plans as a background and come up with their own ideas and methods.

The following section of the handbook includes a number of worksheets for students that they need to complete in the course of the project. Some of the worksheets are an essential part of the lesson plans, others are optional. The worksheets have themes like "What do we know about our city?", "Ideal city: where do we want to live?" or "What can I do to improve the conditions around me?". They include various activities for the students who need to fill them in and subsequently discuss what they wrote with the whole class. The handbook includes

worksheets for different age groups, with more complex problems connected to urban planning presented to older students.

An important section of the handbook describes the main differences between the game and the real life. Even though we pretend to simulate the reality of building a city, the game is just a very rough approximation of the complex processes under way. Teachers need to be well aware of the limitations of the game and be able to explain it to their classes. Otherwise, students might get some quite distorted ideas about the process (such as that buildings do not cost anything to build, or that only one mayor decides what gets built where). This section also includes segments explaining the inner logic of the game mechanisms and the way these should be presented to the students. For example, the concept of the pollution token is quite fictitious (there are no pollution tokens on the real landscape), but teachers should discuss with the class what are the different types of pollution, etc. For the sake of simplicity, the game does not include detailed mechanisms for food production, so fields and farmlands are not present. It is important to make students aware of these limitations, while simultaneously drawing valid parallels to the real life.

The whole second part of the handbook is organized as a game. All buildings as well as events from the game are thoroughly described there, including proposed follow-up activities related to them. Environmental impact of each building is covered as well. Teachers are advised to use this resource creatively in the classroom, for example distributing copies of various buildings and make students present their importance as well as consequences for the environment to the class. Locally endangered species from the game board are a part of this section as well, and students can learn more about them and their habitat.

4.3 The Web

We specifically wanted to create a board game, and not an online game. We are convinced that board games are more suitable for classroom use, as students need to prolong their attention span and jointly engage in an activity that involves real face-to-face interactions. In a situation when children spend more and more time playing online, the board games are one of the last remaining attractive activities away from the computer. That said, we felt that the project should have extensive internet support that would be complementary to the main activities.

Diverse follow-up activities that users can do are the most important part of the website (www.ekopolis.cz). To increase student motivation, for each successfully completed activity there is a reward in the form of virtual bricks. These can be used to purchase buildings, from which each user builds his own ideal city without anyone’s interference.

One of the most interesting activities on the website is the ability of users to make photos of buildings in their city, upload them to a specific location in an application based on Google Maps, and post comments about them for all other users to see. Users are able to judge submissions of other users and get credit in the form of bricks for their successful posts. As a result of this activity, we have a map of Czech Republic that gradually gets filled by student posts.

Other projects on the website are based on the discussion platform, where users can upload content (including images) and comment on them. Students can for example propose projects for real mayors of their city, or create new buildings and Event cards for the game. Some projects are universal for all the users, but teachers can devise their own projects just for their classes. Discussion posts are generally available for other users for comments as well as for inspiration, but can also be made private only for members of a specific class. Teachers can thus use the web to communicate with students, collect their homeworks and provide feedback on their projects.

5 Results

We have extensively pretested the game in several schools and collected anonymous questionnaires from students of the target age group at the end of the class. In general, students were enthusiastic about the game during the class and even those that otherwise have problems in cooperating in groups (as the teachers told us) took part in the exercise. The environment in the class was lively, but constructive, as players were

communicating about the proper rules and adequate strategies. There were no major disruptions of the class, although the discipline was relaxed.

Following are the principal findings from the questionnaire for students with questions relevant to the project as a whole.

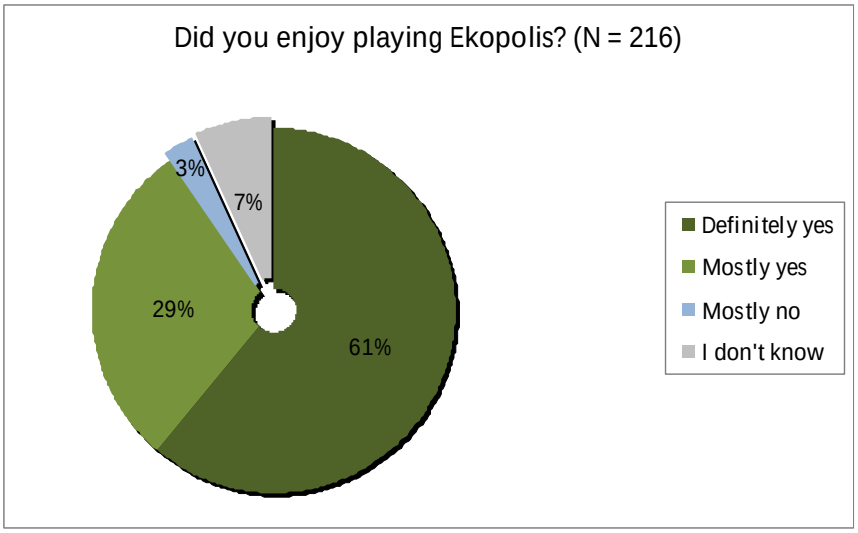

Figure 4. Results from the questionnaire for students

First we wanted to make sure that the students enjoy playing the game. The questionnaires confirmed our feelings from the classroom. The data clearly demonstrate that children enjoy playing games like Ekopolis within the classroom setting.

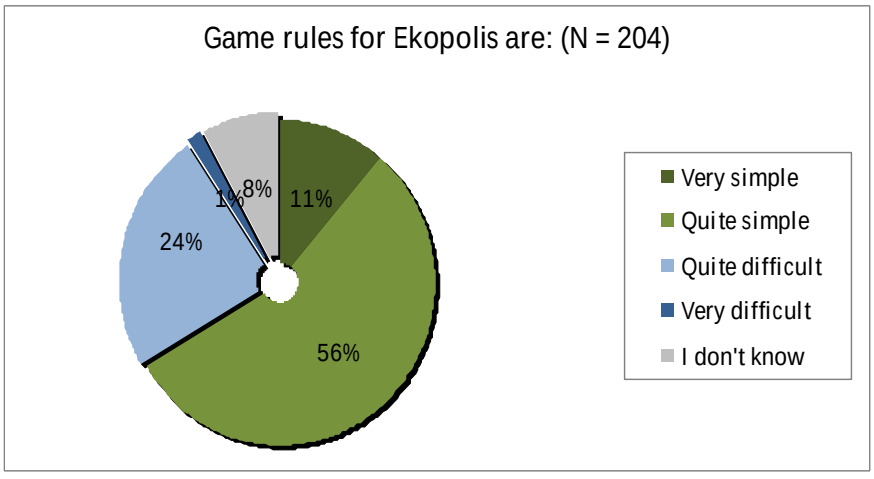

Figure 5. Results from the questionnaire for students

We than wanted to know was whether the game rules are not too complex for the target age group. The data show that on the whole, children find the game rules either quite simple or very simple. Only 1 per cent of respondents thought that the game rules are very difficult.

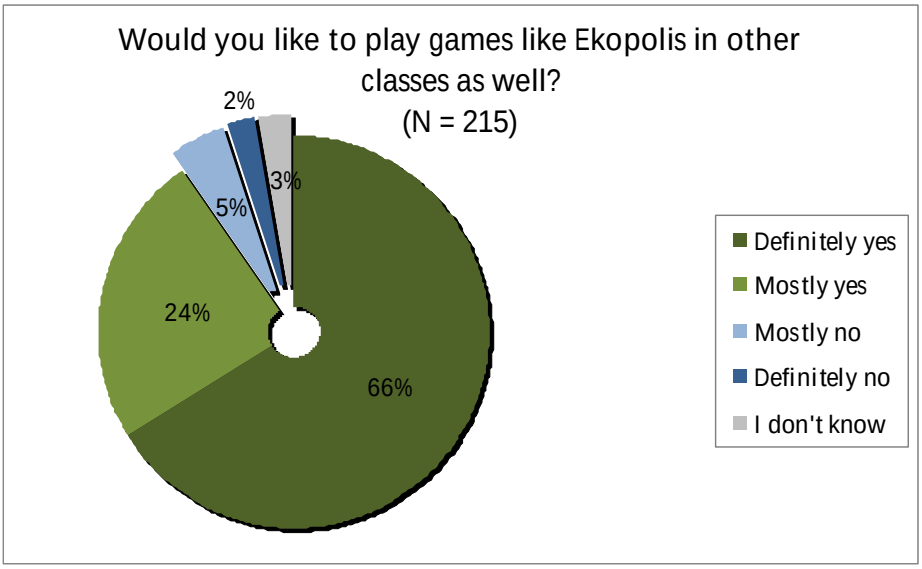

Figure 6. Results from the questionnaire for students

We were interested also in the prospects for further educational board games, so the questionnaire included also a question whether the students would like to play games like Ekopolis in other classes as well. The results demonstrate the motivational potential of board games that could be channeled towards related educational activities and goals.

5.1 Implications

The preliminary research results as well as our direct experiences from pretesting have several important implications. First of all, carefully designed educational board games have a great motivational potential for students, who enjoy this form of alternative activity in the classroom. The game thus excellently fulfills the evocative phase of the learning project. This needs to be supplemented by realization of meaning and reflection in the follow-up activities, which are prepared for teachers in the handbook and on the web portal. This fulfills the model of evocation, realization of meaning and reflection (ERR) mentioned above.

Construction of a city within a board game opens a wide range of possibilities for connecting the experiences of the in-game microcosm with actual cities in which the students live. Drawing these comparisons provides a useful platform for reflection, as it opens a range of questions that the students usually do not ask themselves. The ensuing reflective discussion can stay on the level of environmental awareness about their surroundings, but can also lead to more complex topics, such as modern urbanism.

5.2 Possible Applications

The positive experiences with Ekopolis demonstrate the promising potential of the selected method for other educational topics as well. Board games with simple rules and limited time for game play can serve as excellent evocative activities that introduce basic concepts and vocabulary. For the attainment of educational goals it is important to devise also detailed methodical tools and workbooks that support the realization of meaning and reflection within the project. In the follow-up activities in the class, the discussion can move from in-game experiences to real-life situations.

6 Conclusions

Overall, the project clearly demonstrates the promise of using specifically designed board games in the classrooms. These have excellent evocative potential and motivate students with respect to the selected topic. By playing the game, students acquire the knowledge of basic concepts and key vocabulary. It is important to stress out that just by playing the board game, the educational goals are not automatically attained. The role of follow-up activities is essential for the realization of meaning and reflection. The role of teachers at this stage is

very important, as they need to structure questions and conceptualize diverse problems that the students encounter in the game. The handbook for teachers, which includes detailed workbooks and activities, is thus necessary for successful completion of the educational objectives.

Appropriate design of the board game can greatly improve the chances of educational success, as students start their reflections based on events that occurred during the game. Cooperation of game designers with experts on teaching the specific topic is thus highly advisable. The experts need to specify the primary educational objectives and supervise the game design process so that it can be easily used for the follow-up activities.

The selected methodology behind the Ekopolis project thus ensures the fulfillment of educational goals from the area of environmental education. It does so by a combination of evocative board game, a detailed handbook for teachers and an interactive internet portal, the latter two components ensuring appropriate realization of meaning and reflection. Such approach can be replicated in other educational contexts, thus improving the learning experience for both students and teachers.

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Pedagogical Models

Open Online Courses: Responding to Design Challenges

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Open education and open educational resources movement as a recent trend in higher education focuses on providing free access to a wide range of educational resources and online courses. However, such a narrow approach fails to acknowledge the transformative and innovative opportunities openness can offer in higher education. The authors of the paper take a wider perspective to the concept of openness in formal higher education. In addition to open technology, content and knowledge sharing openness in course design is an important dimension to consider. Although open online course design solves many educational problems and challenges, at the same time it also creates new ones. This paper discusses about the re-occurring course design challenges that facilitators face while designing and running open courses. Through a multiple case study a variety of design responses to the design challenges is analyzed and demonstrated.

Keywords: open online course model, open educational resources, pedagogical design, multiple case study

1 Introduction

The concept of openness has multiple interpretations and dimensions in the context of higher education. Among others, it has been used by proponents of open classroom approach in 1970-ties and by distance education enthusiasts while establishing open universities". The purpose was to solve a number of educational problems and challenges, for instance, to improve access to existing study programmes and attract more (or better) students following Huijser, Bedford, and Bull's (2008) claim that everyone has the right to education. In general, openness in education is attributed to a barrier-free access to education in terms of time, affordability and admission requirements being freely available through the Internet.

A recent trend is the open educational resources (OER) movement (Atkins, Brown & Hammond, 2007), which provides free access to a wide range of educational resources and online courses. OER and its importance has been widely documented and demonstrated (Downes, 2007). The key tenet of open education is that "education can be improved by making educational assets visible and accessible and by harnessing the collective wisdom of a community of practice and reflection" (p. 2) (Iiyoshi & Kumar, 2008).

The notion of openness in education is clearly triggered by the opportunities technological development offers. In addition to growing access to Internet, the latest evolution of digital technology and Web has fostered a new culture of creating and sharing open content in online communities. It has been possible due to the blurred line between producers and consumers of content allowing shifted attention from access to information toward access to other people (Iiyoshi & Kumar, 2008). In the light of ongoing technological development, there are educators who are exploring ways to expand the notion of openness in education beyond public sharing of educational content. Iiyoshi & Kumar (2008) point out that with the concept of openness we might tend to grow our collections of educational tools and resources and miss the transformative and innovative opportunities "openness" can offer. One of the emerging practices in this direction is the open online course model.

Open courses represent one step further from open content and focus on building a course around open resources. Stephenson (2005) suggests that open content together with community forms an open course. According to Fini (2009) open online courses may considered as a special type of OER, which adds an extra dimension of interaction. Good examples are some courses facilitated by George Siemens and Stephen Downes (Fini, 2009), David Wiley, Alec Couros (Couros, 2010) and Teemu Leinonen (Leinonen, Vaden & Suoranta, 2009). According to Iiyoshi and Kumar (2008) there are three main themes regarding openness, which should not be seen as mutually exclusive:

1. open educational technology (e.g. open source software);

2. open content (open educational resources);

3. open knowledge of practice (sharing educational practices).

Open courses should be considered as open approaches to teaching and learning that look for cultural barriers to tear down and traditional instructional arrangements to reconfigure (Iiyoshi & Kumar, 2008). The complete openness is achieved by focusing on openness as a phenomenon in which the content, technology and the process by which they are created are equally visible and open for changes.

From the perspective of pedagogical design the formula proposed by Stephenson is actually more challenging to implement into real-life practice as it may look in the first place. Very often open courses must be supplemented with an academic structure that allows students to receive instruction and credit for these courses if they wish to pursue an academic qualification or degree (Morgan & Carey, 2009). The remaining part of the paper is dedicated to finding answers to the question of how to respond to the design challenges while bringing in the concept of openness in higher educational course design?

2 Pedagogical design challenges of open courses

Designing and implementing open online courses within the framework of formal higher education is a challenging endeavour. The challenge lies mainly in finding a balance between openness and existing formal higher educational frameworks, but also exploring how open models of course design can take advantage of currently dominant structures. Opening up a course brings along the need to reconsider aspects of traditional instructional design and facilitators' tasks. While open courses solve many existing educational problems and challenges, they also create several new ones. Based on the authors' considerably long experiences and practices in designing, implementing and facilitating open online courses within the boundaries of formal higher education a list of re-occurring challenges has emerged. It has to be noted that the following list is not absolute, but rather represents the most frequent aspects that the facilitators have faced so far.

2.1 Creating and sustaining community gravity

One of the main emphasis of open courses is to build communities of learners and scholars around the subject of the course and facilitate the integration of various topics across diverse contexts (Morgan & Carey, 2009). The new task and role for the facilitator in open online course is to bring learners into full legitimate participation in the community and sustain their active participation. Designing forces that strengthen community gravity requires activities that induce learners to the community. The notion of community gravity is used here as a metaphor for creating a participatory architecture for supporting the formation of communities of learners.

Initially people join communities, act and learn at the periphery. According to Lave and Wenger (1991) rather than looking to learning as the acquisition of certain forms of knowledge they place it in social relationships — situations of co-participation. Thus, learning involves active participation in a community of practice. Instead of pushing knowledge to learners, the design challenge resides in pulling learners to a community and sustaining their active participation. It is important to note here that the centre of the community is not a facilitator, but it changes constantly according to the members and the viability of the particular community. The design challenge is to create and facilitate the occurrence of community gravity. If the community manages to create a strong gravity then it draws in members in the peripheral area. It is obvious that the main importance is not only

on learning about subject matter, but also learning to participate in the practice of a field through various technologically mediated activities (Fini, 2009).

Herewith, the questions such as how to design sustainable community gravity; what are the mechanisms for bringing and keeping together distributed groups; what are the tools and techniques that facilitate and support the emergence of strong community gravity will arise.

2.2 Monitoring participation and content flows

Siemens (2006) points out that „society has become decentralized and distributed; our learning models need a similar adjustment, as distributed tools and processes enable learners to experience learning as they experience life“ (p. 9). Pulling information and content together from distributed tools and services, and monitoring students' participation has turned to be another challenging aspect in designing open online courses. From the technical perspective the authors of this paper understand openness as a fundamental shift from centralised, institutionally owned systems towards distributed, user-centred, and user-owned systems, such as a collection of social software tools together with other type of resources. Such a heterogeneous landscape of tools and services chosen by every individual participant requires considering some design aspects of open courses in terms of additional means to control heterogeneity and to follow the flow. At the same time the integration of multiple heterogeneous environments and tools may represent the starting point of a learner's knowledge construction quest (Fini, 2009). Monitoring the course activities becomes a real challenge in massive open online courses. Downes (2010) has compared this kind of courses with a football: "Think of it as football. People do not stop watching football just because they cannot watch everything!"

A collection of challenging questions arises: what are the possible technological solutions for both students and facilitators to monitor participation, observe content flows and comprehend the overall course progress; how a course design can contribute to support monitoring heterogeneous landscapes of tools and services, student created content and their flows?

2.3 Designing materials and activities

Web development and digital technology have changed the roles of content consumers and producers. The line between them has blurred and shifted the attention from access to information towards access to other people. Such a shift should be transferred also to a pedagogical design. It makes little sense to replicate existing patterns of teaching and learning with new technology. Instead, one should see the benefits and new practices that the use of technology and its new culture brings along — culture of sharing and producing, in which content is freely contributed, re-purposed and distributed. Communities of practice produce content itself through the process of exploring subject matter. Reconceptualising course delivery in this way has the benefit of exposing students to a broader spectrum of perspectives and expertise through contacts with diverse cultures and settings, engaging them in a larger community of practice, and facilitating the integration of various topics across diverse contexts (Morgan & Carey, 2009). This encourages the practice of seeking the knowledge when it is needed in order to carry out a particular task (Brown & Adler, 2008). The same issue applies to the pre-design of activities that are required during the course. Web and its development is creating a new kind of participatory medium that is ideal for supporting multiple modes of learning (Brown & Adler, 2008) and various activities. The course design is not considered to be an input anymore, but an output of the course created together with its participants.

It raises questions such as to what extent the material and activities are pre-defined before the course starts; to what extent students' created and recommended activities should be included into this emergent course design.

2.4 Providing feedback

Another complicated issue in open courses is providing feedback to learners. In a course with a large number of participants it is not realistic to expect that the facilitator(s) are able to follow all the communication threads and give feedback to every single assignment. On the other hand getting feedback is an important motivator for participating in open online courses. The challenge for the facilitators is to encourage participants to follow, comment and give feedback to their peers. In addition, a facilitator's role is to encourage participants to accept that a facilitator is not the only person who can and should provide feedback. Peers' feedback can be as valuable as facilitator's comments and critics. This can be done in a comfortable way when participants use for

instance individual Weblogs to produce course related tasks or submit assignments. In an ideal situation comments and feedback lead to more thorough discussion about the subject matter.

An extra layer to this challenge is added by the need to assess participants' subject-related performances. Due to the privacy issues and some university regulations the facilitators face a challenge to provide grades in a fast and delicate way.

Thus, one has to deal with questions such as what type of feedback is realistic and required in open courses; who should provide feedback and how often; how to increase the quality of feedback given by facilitators and participants.

3 Research design

The remaining part of the paper is focusing on the selected cases from the perspective of how pedagogical design has responded to the aforementioned challenges. The study followed a multiple case study approach (Cohen, Manion & Morrison, 2007) representing a specific tradition within the qualitative research paradigm (Creswell, 1998). Multiple case study is defined here as a descriptive research strategy, an empirical inquiry that investigates design challenges of open courses within real-life course contexts. The study aims at examining a limited number of variables (design challenges) and identifying similarities and differences of pedagogical design of various open courses. The cases were chosen from courses where the authors have participated as facilitators or learners. The choice of the cases was made so that it could get a representative sampling of the outstanding open online course design and would represent some of the mentioned challenges.

It has to be noted here that the study does not aim at providing cause-effect relationships and ready-made recipes for dealing with the open course design challenges, but focuses more on describing and understanding various design responses to the challenges. Whether the design responses contribute to the success of the participants learning is not the purpose of this study.

4 Description of cases and their responses to design challenges

4.1 Case 1 — Composing free and open online educational resources

The course was organized in spring term 2008 in University of Art and Design Helsinki. Since there was a small group of local students the facilitators decided to open up the course for other people who were interested in the topic. They set up a course page on Wikiversity and promoted it in Weblogs. As a result about 70 people from 20 countries signed up for the course. One of the authors was a co-facilitator in that course.

This was the first open online course for both facilitators and for most of the participants. Due to lack of previous experience it was challenging to create a sustainable learning community. Only 15 participants completed all the required course assignments. Participants' feedback showed that there was too little effort from the facilitators to build a community. For instance, there were no group assignments and a video-conference was organized only once at the end of the course.

Main components of the learning environment provided by the facilitators were a course Weblog, a course wiki and participants' Weblogs. Participants enrolled to the course on a wiki page. The facilitators managed a list of active Weblogs manually. For participants it was difficult to follow the course because they did not always know where the activities were taking place: in the facilitators Weblog, in some of the participants Weblog or in the wiki etc. There was clearly a lack of central tool that would aggregate all the course activities, thus support monitoring participation and content flows.

In this course the facilitators created very little content. They prepared a wiki page with course syllabus, list of suggested readings and short descriptions of weekly activities. In addition, every week the facilitators wrote a post that elaborated on a weekly theme. The course participants played a crucial role for producing topic related materials.

Providing feedback was one of the shortcomings of this course. The facilitators followed the participants' Weblogs but commented only on some rare occasions. Most interesting Weblog posts were highlighted in a

weekly summary that was posted to the course Weblog. Course feedback showed that this was not enough for many participants. Final assessment was published openly on a wiki page (pass, complementary work required).

4.2 Case 2 — Learning environments and learning networks

Learning Environments and Learning Networks is a compulsory course for educational technology masters students in Tallinn University. The course was first run in autumn term 2010 with 29 participants. Two of the authors were facilitators in that course.

Similar to the previous case this course was organized as a blogging seminar. In addition to online seminar the course had four contact days that helped to form the learning community. Last weeks of the course were devoted to a group project. There were a few highly motivated participants who always did their weekly assignments very thoroughly. They became important actors in the learning network representing the centre of community gravity and other participants often referred to their Weblog posts.

In order to monitor participation and content flows the facilitators used an online feed reader EduFeedr (Põldoja, 2010). The participants signed up for the course by adding their personal information and Weblogs to the enrolment page in EduFeedr. EduFeedr aggregated all the Weblog posts and comments and recent activities were displayed on a course feed page. EduFeedr also visualized the progress of participants based on weekly assignments and social network between the participants (see Figure 1). The social network is based on comments and links between the participants' Weblogs.

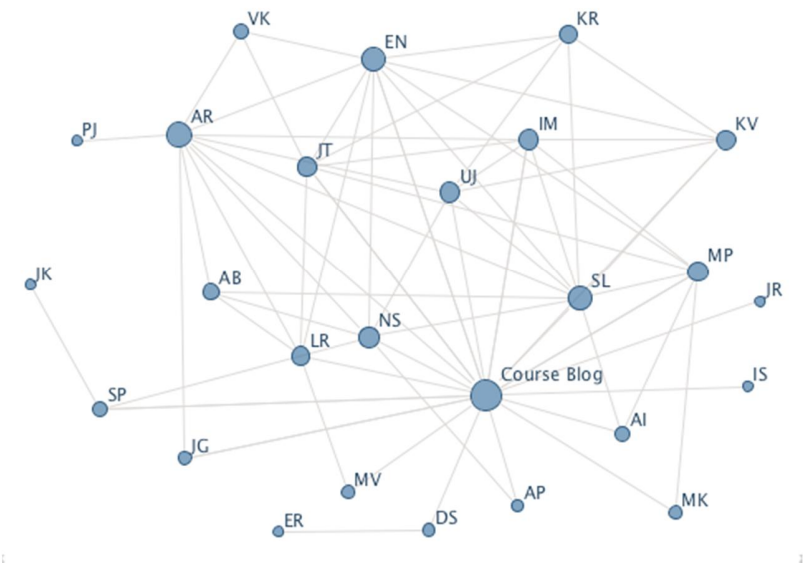

Figure 1. Social network between the participants (student names are replaced with initials).

The overall framework of the course topics was provided before the course started. The course facilitators defined specific course activities and a list of suggested readings on a weekly basis following the overall course progress. The participants were expected to carry out weekly tasks in the form of Weblog posts by creating additional material for the course. Every week the facilitators wrote a summary post that elaborated a weekly theme and presented some interesting material pointed out by the students.

In this course the facilitators made an effort to provide feedback for all the participants' Weblog posts that had original ideas or important questions related to the course topics. It required a considerable amount of time but it also encouraged other participants for the discussion. It was possible to follow all the comments through EduFeedr but with current online tools there was no straightforward way to see all the comments made by a particular participant at once.

4.3 Case 3 — Learning & knowledge analytics 2011

The third case is a large scale international open online course that was organized in spring 2011 by George Siemens and a group of co-facilitators. This case differs from previous two because it was not connected to any institutional course and all the participants attended without getting credits. The course started with more than 200 participants, but less than half of them took actively part in the learning activities. One of the authors was among the participants.

The facilitators had a prior experience with running several similar open courses with large number of participants. Moodle forum and Twitter were used as the main communication tools. Posting to a forum or microblog requires typically less effort than writing a Weblog post. Therefore the communication between the participants was more active. This was also supported by weekly online conferences where the participants could use chat during the video lectures. In their model creating and sustaining community gravity was not the priority, instead, the participants were free to decide in which learning activities they will participate and how much time they are able to contribute.

Monitoring the communication and content flows was supported by facilitators' daily summary posts. The participants created also a daily snapshot of most interesting tweets using the paper.li online service. It was possible to subscribe to Moodle forum and receive new posts by e-mail. However, monitoring content flows and participation was pretty much left to the participants to organise.

The facilitators prepared the course syllabus and list of suggested readings. Each week a different expert was invited to give a short online lecture. Recordings of the lectures were made available afterwards. As in other analysed cases the participants created the majority of content during the course.

Providing feedback was not an important issue because there were no compulsory assignments. However, the facilitators were following the discussion in the forum and in Twitter. A common way to acknowledge ones' microblog post in Twitter was to re-tweet it. Re-tweeted posts could be noticed also by people outside the course community.

5 Discussion

The previously described cases represent in one way or the other an open course model. Creating and sustaining a community in open online courses is an important design aspect to consider. The Case 2 shows some consciously designed efforts for creating and strengthening the community. Four face-to-face meetings during the entire course definitely support getting to know peers, strengthen the online connections that have emerged during the course, thus contributing to build a community of interested learners around the course topics. In all cases the facilitators wrote summary posts, which pointed out some of the most interesting and thorough posts from the students. Highlighting some of the participants' works invites others to look at them moving the gravity towards these participants. Citing and commenting peers' work can be seen as the body of evidence for pulling participants to focus on the best and interesting work. According to the analysis of the cases, the other two cases have not put much additional effort to create and sustain the community gravity. The Case 3 rather emphasises the occurrence of many smaller communities by encouraging participants to initiate their own discussions with their own chosen media.

The Case 1 shows that monitoring participation and content flows would benefit a lot from having a dedicated tool that is easy to manage for both participants and facilitators. Currently available feed readers serve the purpose to a certain degree, however, they lack specific functionalities that will be beneficial in learning and teaching context. The Case 2 shows that EduFeedr as a monitoring tool was actively used by the facilitators and students. Although the tool is in beta version and showed some drawbacks, it has a potential to support monitoring participation and content flows in open courses.

All the described cases provided a list of topics and suggested readings, which was expected to complement with the materials and discussion topics chosen by the participants. Informal participants in cases 1 and 3 were more active in this regard. Perhaps the formal university framework and the traditional roles of teachers and students play a role here. Being used to be passive receivers the sudden freedom to organise one's own course topics was unexpected.

In all three cases facilitators' feedback to every submitted assignment and activity was not considered necessary. The facilitators made only occasional comments to the most interesting, thorough or provoking works. Instead, all three cases took an approach in which facilitators gave feedback through their weekly summaries. In common to every case the facilitators encouraged learners to comment and give feedback to each other's work. The use of individual Weblogs can serve this purpose very well. However, asking participants to use personal Weblogs does not necessarily lead to intensive commenting on peers' work. In the framework of formal higher education in which some of the participants are often obliged to enrol certain courses, thus lacking interest in them, additional encouragement is needed from the facilitators' side.

6 Concluding remarks

OER and open course model have a potential to contribute to rethinking and reconfiguring pedagogical practices in higher education. The current mainstream thinking of openness is mainly related to the attempt to offer everybody an opportunity to freely access materials and courses. However, these movements also provide some food for thoughts of how to redesign traditional patterns of learning and teaching in a way that it supports the needs of today's learner.

This paper presents a list of typical reoccurring problems and challenges of open courses and analyses three different cases with respect to these pedagogical challenges. The design solutions of these courses have left many aspects of traditional instructional design open with a purpose to let the participants to decide and design their own learning experiences. Moving towards openness in course design is very often a challenging transformation altering significantly the role of learners and facilitator, but also the foundations underpinning their relationship. It is a matter of accepting profound changes of basic assumptions, attitudes and beliefs an open course design brings along and implies the establishment of a new culture in higher education.

Obviously there is a need to study design aspects of open courses further from the perspective of students' performance, their changed roles and patterns of activities and their expectations and challenges. The research in this area would greatly benefit from a thorough collection of success stories and failures of open course design.

Acknowledgements

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Enlargement of Educational Innovation: An Instructional Model of the Case Forest Pedagogy

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This paper focuses on the expansion of an educational innovation (Case Forest pedagogy) that bridges learning in formal, non-formal and informal settings. The Case Forest pedagogy is built on project-based learning and learning by collaborative designing of so-called learning objects, both of which take place partly at school and partly in chosen natural and cultural environments.

The research task in this study is to find out how participants from eight different European countries, which took part in the project (N=238) *Case Forest – pedagogy towards sustainable development*, experience the Case Forest model and evaluate its usability from the perspectives of their own educational cultures. The main sources of data are the reports from each country. In addition, we have used transcripts of the oral presentations of the reports and responses to a short questionnaire. We employed a data-driven qualitative content analysis to determine the problems, possibilities, users and dissemination of the results of the Case Forest pedagogy.

The results indicate that the teachers found current school practices, belief systems and traditional models of teaching problematic. However, many of the teachers participating in the project also saw the model as one way to change the school practices, overcome many of the current constraints, and release the vast potential of the learners. The students have already been eager to take responsibility for their own learning and to use technologies to exercise choice and collaboration.

Keywords: Educational innovation, learning by collaborative designing, learning object, project-based learning, pedagogical model

1 Introduction

One expects that teaching in learning institutions is grounded in scientific and higher-order professional knowledge. This usually means that the teacher conveys knowledge that is based on research or well-grounded practices. Formerly, educators were not interested in what the students thought, felt, expected or were interested in. It is important that students discover what is known about the world. But, it is equally important to involve students in knowledge building and thus enable them to understand what working with the knowledge is and how we as human beings acquire and utilize knowledge (Bereiter and Scardamalia, 2003).

As a consequence of these arguments, students should participate in authentic knowledge construction communities and problem solving processes that seek answers to the existing challenges. This implies that we should regard designs or artifacts themselves as goals for learning and collaborative designing as a valid approach to working with knowledge (Bereiter and Scardamalia, 2003). Therefore, students should be repeatedly put into roles of co-architects and co-researchers during their learning processes (Enkenberg, Liljeström and Vartiainen, 2009).

Learning is a lifelong process (Life long) that takes place in various situations (Life wide) and in cultural practices in which we participate (Life deep). It is proposed that those practices are also the most powerful mediators in learning (Banks et al., 2007). Consequently, if we want to deeply affect our students' learning, we must be able to integrate our educational enterprises with all the connections and living environments where they naturally occur.

This paper focuses on an educational innovation (Case Forest pedagogy) that connects learning in formal, non-formal and informal settings. The pedagogical model has been developed by a research group lead by Professor Jorma Enkenberg in the University of Eastern Finland, School of Applied Educational Science and Teacher Education, Savonlinna.

2 Theoretical framework

2.1 Learning in formal, non-formal and informal setting

The topical challenge in the international research community is to discover new ways to educate our students for the future. Because of emerging technologies and communities that develop around them, learning outside school seems to become increasingly relevant to modern life. We argue that if we continue to work with students as we do today, most of them will be bored, gazing with longing out the school window to the other world that is becoming more interesting to them.

Informal learning can be enhanced in daily social situations and non-formal learning in designed environments, such as museums, gardens and science laboratories. Formal learning takes place in situations and environments that are specifically designed for learning (Eshach, 2007). In order to respond to the challenges, learning environments should be seen as a kind of extended school environment. In addition to traditional classrooms, they should include authentic activities that are situated outside the school, as well as technological tools that can function as bridges between school and the environments external to it (Edelson and Reiser, 2006).

2.2 From part-task to whole-task approach in learning

Should we educate students from the basic elements towards the whole or proceed backwards from the whole to the basics as, e.g., Perkins (2009) has proposed. In the challenges that we face and the situations we encounter in our lives, it is a question of wholes in a meaningful education. Many of today's challenges cannot be solved from only one perspective; we need a group of engaged people who come from different backgrounds and possess different types of expertise.

Communal activities offer possibilities for constructing the answer. In regard to sustainable development, it is easy to see the need for collaboration. There are people who are specialized or particularly interested in the environmental, economic or social perspective of sustainable development. If we can bring these people with different points of view together, it becomes possible to develop society in a more sustainable direction. They form a community of interest that shares a common goal, but its participants approach the phenomena from different perspectives (Fischer and Redmiles, 2008).

This perspective on learning challenges the traditional role allotted to the student in the classroom or in an educational setting. Traditionally, students are relatively passive. Study is based on lectures, exams and tasks carried out individually. Current research-based pedagogical models emphasize collaborative activities that consider the student playing a central role in the functioning of schools, including the role of teaching other students. Students do not memorize and perform repetitive tasks. Instead, they are open to ideas, collaboratively creating and sharing knowledge, constructing, remixing and redesigning new concepts, and continually formulating creative solutions to unexpected problems that have a key position in the learning setting (Resnick, 2002).

2.3 Learning by collaborative designing of learning objects

Design is a social process and a core human activity. Learning by collaborative design has been seen as one possible instructional approach appropriate for learning, which places a special emphasis on socially shared and developed thoughts, ideas and knowledge (Roth, 1998, Harel, 1991; Hennessy and Murphy, 1999; Kafai, Ching and Shih, 1998).

The Case Forest pedagogy is based on learning by the collaborative designing of learning objects. By learning objects we mean digital representations of real objects that represent the phenomenon in question and the tools for constructing meanings relating to it. Representations directly or indirectly refer to real objects and the contexts in which the objects are situated, thereby allowing us to perceive the objects from different

perspectives. When learning from these objects, the learners also benefit from the tools that augment physical and cognitive activity (Enkenberg, 1993; Kim and Reeves, 2006; Hutchins, 1995).

The activity is divided into four main phases, which take place partly at school and partly in the chosen natural or cultural environment. The process of the learning project is described in figure 1 below.

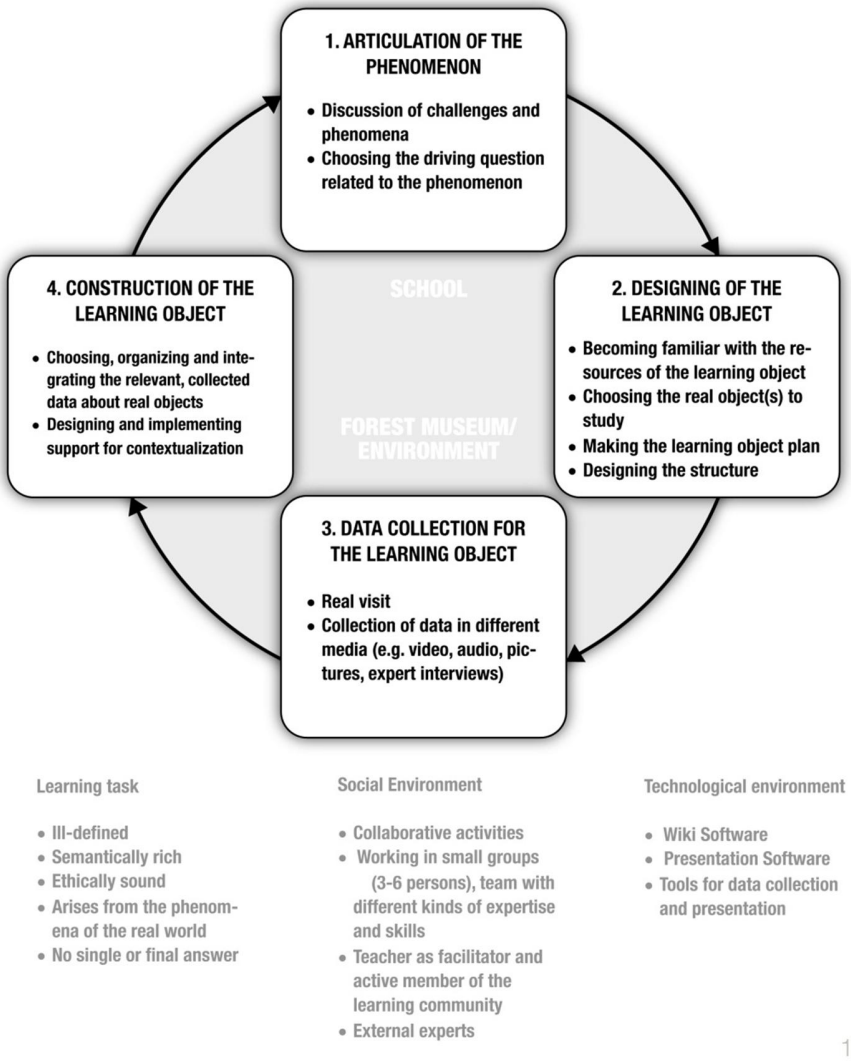

Figure 1. Learning by collaboratively designing learning objects

The learning objects can serve educational purposes in two ways:

a) Learning by collaborative designing of learning objects, where students and teachers together construct learning objects. This can be called learning in community (community of learning; cf. Rogoff, Matusov and White, 1996).

b) Learning from and with learning objects, where the learning objects are resources for learning.

In most cases, learning objects of the latter kind have been designed and implemented by experts and teachers. The experts come from different cultures or disciplines, but all of them have the same interest (this is an example of a *community of interest*).

2.4 Challenges to be solved in innovation enlargement

Among others, Bereiter and Scardamalia (2003) have questioned the ability of learning institutions to respond to the challenges of the emerging knowledge, or innovation, society. Normally, the distance from the birth of innovation to its deployment and stabilization in organizations is long. Organizations retain previously adapted technologies, or models of behaviour, and typically abandon them only when something external demands it.

This kind of situation is also typical for learning institutions; creating, adapting and making use of an innovation occurs slowly. Educational institutes are rarely oriented towards innovative behavior. Another explanatory factor can be so-called path-dependency, which is a widely known phenomenon in economics (Liebowitz and Stephen, 1995). Organizations firmly hold on to practices, belief systems, cultural values and models of behavior that they have assimilated during their historical run.

3 Research methods

3.1 Research methodology

Several researchers (Brown, 1992; Collins et al., 2004; Sandoval & Bell 2004) have pointed out the difficulties in translating theoretical insights into educational practice. Thus, an increasing number of educational studies utilize the *design-based research* approach, which can compose a coherent methodology that bridges theoretical research and educational practice. Design research focuses on theory-driven designing to generate complex interventions (e.g., learning environments) that also contribute to theory building and can be improved through empirical study. (Design-Based Research Collective, 2003; Wang & Hannafin, 2005; Sandoval & Bell, 2004.) Design research is not only a single approach but also relies on several other approaches; practitioners and researchers work together to produce new theories, products and practices, which influence learning and teaching in real world situations (Barab and Squire, 2004). Design-based research is a promising method that enables researchers to collaborate with teachers in order to produce significant advances in pedagogy as well as technology, thus enabling sustained cycles of innovation in education (Zhang, 2009). Design research typically represents the so-called mixed method strategies where the collected research data are both qualitative and quantitative (Johnson & Onwuegbuzie, 2004).

3.2 Research object

The Case Forest project has served as an object of this study. The aim of the project has been to increase the knowledge about forests by facilitating the teaching and improving the learning about them in schools. The project has been funded by Education and Culture DG from the Lifelong Learning Programme. The partners of the project come from eight countries in Europe: Finland, Sweden, Estonia, Latvia, Lithuania, Bulgaria, Slovakia, and the Czech Republic. These partners differ in educational history and culture. The development of the project is described in figure 2 below.

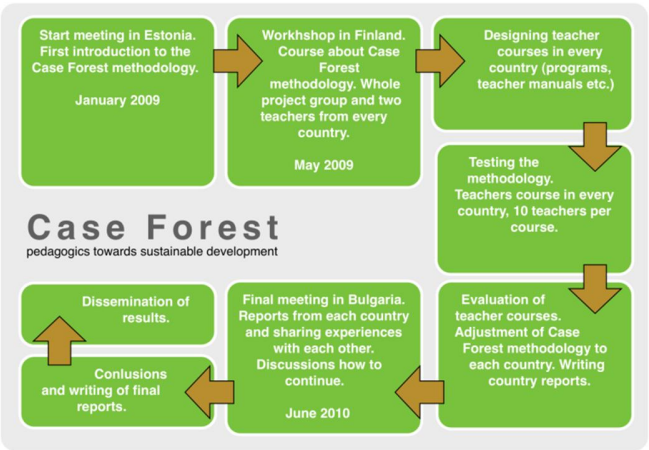

Figure 2. The development of the Case Forest project

The pedagogical model and its background were initially presented to the participants in Estonia. In the spring of 2009, the project participants and two teachers from each country attended the Case Forest workshop in Finland. The idea of the workshop was to introduce the model more deeply and put it in practice. In this model course, the participants implemented their own learning projects by designing learning objects from samples selected from the collections of the Finnish Forest Museum. After this course, a similar course was arranged in every country. The project members and teachers attending the model course were responsible for the implementation of the teacher course in each country.

The final meeting was held in Bulgaria in the summer of 2010. The project members were required to write a report on their own teacher course and give an oral presentation about their experiences. Figure 3 describes the responsible organizations and total number of project participants in each country.

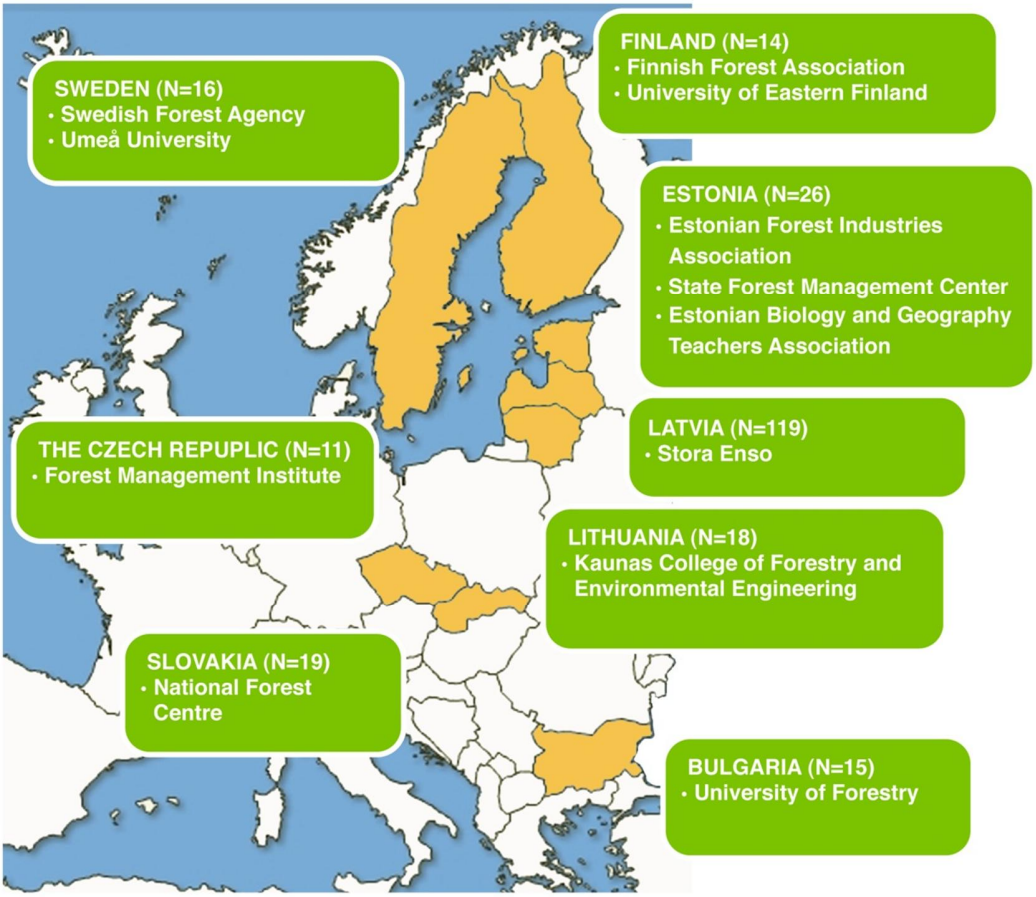

Figure 3. Responsible organizations and total number of participants of the Case Forest project

3.3 Research questions

The main interest of the research has been how the teachers that represent different educational cultures and backgrounds experience the Case Forest pedagogy. Based on this, the study aims to find answers to the following questions:

1. What kinds of problems do the teachers who took part in the national teacher courses think the Case Forest pedagogy will face?

2. How did the teachers envision the possibilities of the Case Forest pedagogy?

3. How would the teachers report and disseminate the results obtained during the project?

4 Collection and analysis of data

During the entire project, various data were collected in several phases of the process. This paper focuses on the materials collected in a seminar held in Bulgaria in June 2010. The main source has been the country reports written for the meeting by the project members. In addition, transcripts from the oral presentations and responses to the short questionnaire have been used in order to attain deeper insights into our research questions.

4.1 Country reports

The project leaders from the Swedish Forest Agency designed the questions used in the country reports (N=8). The project members were asked to introduce the teacher course that they organized (e.g., the participants and materials), present documentation of their proceedings, and summarize the result of the evaluation of the course.

For the evaluation of the teacher course, the project leaders designed a compulsory questionnaire that included the possibility for the project members to add their own questions. The questionnaire sought to identify participants' backgrounds and their attitudes towards the model immediately after the course. The members in each country needed to translate the questionnaire into their native languages and then write a summary of the results in English. In these summaries, the project participants answered the following questions:

What problems do you see in implementing the Case Forest methodology in your country? (Problems)

Do you think the Case Forest methodology can be adjusted to fit your national conditions and, if so, how? (Possibilities)

Who are the potential users who will benefit from the project in your country during the lifetime of the project, and after the project has finished? (Users)

How will you reach the potential users and how you will inform about the result of the project? (Dissemination of results)

What is your opinion about the implementation of EU policies and education systems? How does Case Forest contribute to EU policies in your country? (EU policies and education systems)

This paper focuses on the first four questions (because of a very few short answers to the question related to EU policies and education systems). The *possibilities* and possible *users* items were combined in the analysis of the data.

4.2 Presentations

The project members from each country gave an approximately thirty-minute PowerPoint presentation on the basis of their written reports and experiences. All the presentations were recorded, transcribed and used as supplementary material in the data analysis.

4.3 Questionnaire

Before meeting in Bulgaria, the project members were asked to participate in a short e-questionnaire conducted by the researchers. The questionnaire focused on views about and experiences of the Case Forest pedagogy. Thirteen people answered the questionnaire: project members from Lithuania (N=4), Bulgaria (N=1), the Czech republic (N=1), Sweden (N=1), Latvia (N=1), Estonia (N=1) and Finland (N=4). The questionnaire was used as supplementary material in the data analysis.

4.4 Data analysis

We have employed data-driven qualitative content analysis (Mayring, 2000). Answers to the questions have been categorized first into subcategories and then into abstracted interpretations.

5 Results

5.1 Problems in implementing the Case Forest pedagogy

The problems in implementing the method mentioned in the country reports, presentations and in the questionnaires were categorized as a) problems related to the technological tools or use of them, b) problems related to human activity and c) problems related to organizational and administrative activities. The first category relates to the affordances the learning institutes have in the country, the second to the educational culture and the last to the educational policy.

All countries except Finland, Bulgaria and the Czech Republic cited the lack of technological tools in schools. Interestingly, no other countries besides Lithuania mentioned the tools that the students already have in everyday use:

> *we have of course …have lack of digital cameras …of financial resources… but I …sometimes …were…angry…because I think that our pupils …have mobile phones, they can't use it in lessons times without problems and …all the schools …use this material what do they have.* (presentation; Lithuania)

According to project participants from Slovakia, there is also a problem because the students are more skilled in ICT than the teachers are. In the reports of Slovakia and Latvia, the problem with the teachers' insufficient IT-skills and the recognition of it were mentioned:

> *It is hard to aware that majority of teachers knew about IT possibilities nothing. They are afraid to loose reputation.* (country report; Latvia)

The activities and attitudes of the teachers were emphasized in category b) problems related to human activity. According to project participants from Estonia, Slovakia, Sweden, Finland and Lithuania, the teachers' attitudes present a problem, especially the attitudes towards new pedagogical approaches and towards new technology:

> *Older teachers are conservative and feel respect and fear to use new methods* (presentation; Slovakia)

> *Some teachers, who are interested in outdoor education, are against increasing use of Internet in teaching* (country report; Estonia)

Also, the routine and lack of cooperation among teachers were mentioned in the report from Latvia. According to project participants from Finland, problems also exist in the general attitudes of students, colleagues and principals.

Lack of time and financial resources were emphasized in c) problems related to organizational and administrative activities. Lack of financial resources was mentioned in the reports of the Czech Republic, Estonia and Latvia. The Czech Republic and Latvia further emphasized the political regulation of education:

> *school reform (reduction of number of teachers; increasing amount of work; increasing demand for paper work; reduction of salary) - > very hard to be optimistic and creative in such kind conditions* (country report; Latvia)

> *Forest pedagogy isn´t certified by Ministry of Education as a educational topic and schools don´t want to spend their money on uncertified courses; Ministry of Agriculture doesn´t have enough money to provide such courses for free.* (presentation; Czech Republic)

Lack of time, the structure of the school system and the curriculum were discussed by many of the project participants. However, it seems that the problem is not so much in the curriculum itself, but rather in its implementation:

> *Estonian state curriculum supports inquiry learning, but sometimes school management is too rigid and does not afford long-term learning projects.* (country report; Estonia)

> *We don't have any constraints regarding the curriculum in Sweden. Outdoor teaching is a natural part of the schoolday in many schools, but many schools do not offer any outdoor education at all to their students."*(questionnaire; Sweden)

Figure 4 summarizes the problems in implementing the Case Forest pedagogy.

COUNTRY	CZ	EE	LV	SK	FI	LT	BG (*)	SE
Technological problems								
Lack of equipment	-	+	+	-	-	+	-	+
Teachers insufficient IT-skills	-	-	+	+	-	-	-	-
Social problems								
Teachers attitudes towards new technology	-	+	+	-	-	-	-	-
Teachers attitudes towards new pedagogical approaches	-	+	+	+	-	+	-	+
Attitudes of pupils, colleagues or principal	-	-	-	-	+	+	-	-
Contextual problems								
Lack of financial resources	+	+	+	-	-	+	-	-
Lack of time	-	+	+	-	+	+	-	+
Curriculum	-	-	-	+	-	+	-	-
Political regulation of education	+	-	+	-	-	-	-	-

(*) *Note that according to the report from Bulgaria, there are no problems using the methodology. In the presentation they mentioned "obligatory problems", but did not explain them further.*

Figure 4. Problems in implementing the Case Forest pedagogy.

5.2 Possibilities of the Case Forest pedagogy

The ideas regarding the possibilities in implementing the pedagogy in each country were categorized as a) possible users, b) collaboration possibilities and c) pedagogical possibilities.

The project participants from each country presented several possible future users for the method, from kindergarten to university, and programs outside of formal education, e.g., *School educational programmes* (the Czech Republic), *RMK Nature Centers and Environmental Education Department of Environmental Board* and *Camp-schools* (Estonia), *kindergarten, primary school and secondary school teachers, youth education programmes* (Finland), *Professional Schools on Forestry and University of Forestry* (Bulgaria), and *high school schoolchildren, teachers themselves, primary schools, young forest friends cluster, seminars, extracurricular activities, cams, family gathering, distance studies* (Lithuania).

The project participants from Estonia reported:

> *[The] Case Forest methodology develops cooperation between formal education system (schools) and informal education (museums/nature education centers), which strengthens networks for sustainable development.*

The pedagogical model was also deemed appropriate for integrating different subjects in Estonia and in Finland. In Sweden, the project members planned to continue collaboration with the teachers who attended their teacher course:

> *When the teachers have reported back to us with their experiences from their own work, we will adjust the course ant try to obtain a structure adapted to Swedish conditions. Afterwards we hope that we will be able to offer this course to teachers throughout Sweden. In this way we hope to reach out with the method to a large number of teachers in Sweden in the future.* (country report; Sweden)

Many of the project participants also discussed the possibilities that the pedagogy creates for learning:

> *It enables working outside the classroom, allows us to use inquiry as a learning method, makes learning methods more versatile, allows a child to be a subject of his learning, allows the co-operation of the pupils and changes the role of the teacher from a teacher to a co-learner* (questionnaire; Finland)

> *It is a way to avoid dull, uninteresting, meaningless and noisy classroom situations. And a way to reach new pedagogical rooms.* (presentation; Sweden)

> *[I]t is very good also this is not traditional way for education and …it will be…very interesting for pupils for scholars* (presentation; Bulgaria)

> *If teacher is good planer CF methodology is the best way how to teach effectively and interesting, involve pupils and get best rating as modern and advanced teacher* (questionnaire; Latvia)

Also, in the reports of Latvia and Slovakia, the Case Forest pedagogy was seen as a way of changing current models of education:

> *It also has a potential to be one of the important tools for realisation of reform in education system to change a traditional school to an advanced school by new methods implementation and innovation involvement.* (country report; Slovakia)

5.3 Dissemination of results

The answers to the question about the dissemination of the results were categorized as a) forthcoming events, b) www-materials and c) articles. All the project participants had created web pages, which served as the main channels for the dissemination of the results. Some of the participants were planning to organize Case Forest pedagogy events (the Czech Republic, Estonia, Sweden), and in Finland the project participants had already organized a Case Forest workshop on national forest pedagogy day. The project was also presented by the Slovakian representative in October 2009, during the 4th European FP (Forest Pedagogy) convention. Project participants from Estonia, Finland and Slovakia had published articles about the course in national newspapers and journals.

6 Discussion and conclusions

The aim of this study was to determine how the project members from different European countries experience the Case Forest model and evaluate its usability from the perspectives of their own educational cultures. The results of the study indicate that, in most of these countries, the following factors were seen as problems: teachers' attitudes towards new pedagogical approaches, lack of equipment, financial resources, and time.

Also, the lack of technology or the teacher's insufficient skills in using technology were often mentioned, while the tools that students already expertly use in informal settings were not mentioned. In most of the countries, the students are not allowed to use those tools at school and thus benefit the entire learning community. Overall, it

seems that some of the Eastern European countries experienced problems related to the political regulation of education and the affordances that the learning institutes have. In the Nordic countries, the problems were related to the teachers' attitudes and the strict division between school subjects and lessons, which may also refer to the problems in co-operation between teachers.

Many project members criticized the current subject-based school curriculum that offers limited opportunities to implement these kinds of deep and time consuming learning methods. Implementing the model in schools, in collaboration with external organizations and experts, will demand changes in school culture. Many project participants also saw the model as one way to change school practices, overcome many current constraints, and help educators facilitate an escape from the deficit models so prevalent in educational institutions, thereby releasing the vast potential of the learners (Hawkey, 2004). They also believe that the students are already eager to use technologies, to exercise collaboration and to take responsibility for their own learning.

In most cases, the development projects live only as long as external funding is available. In regard to Case Forest, the situation seems to be different. The project members have actively sought ways to disseminate the project's results. After the final seminar, we have had the opportunity to observe the work of some Finnish project members and teachers. These persons have organized several Case Forest workshops and are currently planning the next ones. In addition, one of the teachers has written a book that includes a description of her implementation of the Case Forest pedagogy. She is also organizing a national Case Forest network for kindergarten teachers.

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Towards a Pedagogical Model for Work-Based Mobile Learning in Tourism Education

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Developments in the tourism industry force tourism companies to constantly seek novel ways to appeal to their old and new customers. The availability of skilful staff is key to ensure positive development and bring new ideas into practice. Schools providing tourism education have to take the challenge and renew their degree programmes to match the changing needs of working life. This paper presents a study that aimed to design an initial pedagogical model for work-based mobile learning (WBML) in tourism education, implement it during an apprenticeship period, and analyze the initial model in relation to the teaching and learning processes that occurred. The research setting was at the TravEd Pyhä tourism school, which operates under the Vocational College of Eastern Lapland and is decentralized from the main campus at the Pyhä ski resort. In practice, the developmental work of this study was carried out through a design-based research (DBR) process. The approach to learning in this study leans on the socio-cultural tradition, central to which are the activities, culture, context, and environment in which the mobile and work-based learning took place. The data used in this research consist of students' learning diaries, reports, and reflective summaries of their apprenticeship period. The results of this study contribute to the further development of a pedagogical model for WBML.

Keywords: tourism education, work-based mobile learning, pedagogical models, design-based research, apprenticeship

1 Introduction

Tourism is one of the critical business areas in Eastern Lapland, Finland, and lately, the growth in this area has been strong. In order to address the intensifying competition over customers and stand out with something unique to offer, tourism companies have to keep up with the development in the industry and ensure the quality of their services. The availability of skilful and development-oriented staff is an unquestionable prerequisite for this, which also sets a challenge for institutions providing tourism education. The best way for vocational schools to keep up with the rapid pace of development is to react beforehand to the changing needs of the tourism industry by networking with universities, research institutes, and tourism companies.

The research setting of the study presented in this article is located at the TravEd Pyhä tourism school that operates under the administration of the Vocational College of Eastern Lapland but has been decentralized by physically moving tourism education from the main campus to Pyhä, a ski resort located in Eastern Lapland. Decentralization also describes the period of apprenticeship, which covers one-third of the two-year degree programme, during which students might be tens or hundreds of kilometres away from the school or even abroad.

The aim of this study was to start the development process of a pedagogical model for work-based mobile learning (WBML) in tourism education and to explore the possibilities of mobile technology in work-based learning during the apprenticeship periods that students spend working at tourism companies. In practice, research and development was conducted as a design-based research (DBR) process presented in Table 1. Generally DBR aims to improve educational practices and theoretical constructs through iterative stages of design, implementation, and analysis (Brown, 1992; the Design-Based Research Collective, 2003). Essential to

DBR is a tight connection between theory and practice, which in this case was realized in the collaboration between researchers, teachers, and students of TravEd Pyhä tourism school and the entrepreneurs at the Eastern Lapland tourist destinations. The interaction between theoretical and practical agents brings about the twofold goals of DBR: it aims to produce new theories, artefacts, and practices that may have an impact on learning, and it also aims to explore these theories and investigate the changes they bring on a local level. This dual goal brings DBR very close to a kind of learning that takes place in authentic settings, such as educating tourism professionals at an actual tourist destination.

Table 1. The first DBR cycle

	Design	**Implementation**	**Analysis**
1st pilot November 2010	Designing an initial pedagogical model on the basis of theoretical knowledge and previous pedagogical models	Piloting the initial model: Online tutoring for tourism students during the apprenticeship period Collecting data	Analysing data Assessing the initial pedagogical model in relation to teaching and learning processes realized during the apprenticeship

The work started with designing an initial pedagogical model for WBML in tourism education, which is presented in detail later in this article. The second step was to implement the pedagogical model, which was done during the eight-week long apprenticeship period. During this time, students worked at a tourism company of their choice. Before the period, students were trained to use the blogging software WordPress to write a learning diary about the things they learned at work and to reflect on the learning goals they had set for themselves. Online learning diaries were seen as a safe place to reflect on learning, especially when the on-going activities might have seemed overwhelming or students felt displaced or scared of being out of control (Prinsloo, Slade, & Galpin, 2009). This can sometimes be the case during the busiest season at a ski resort. It was advised to keep bogs private during the first apprenticeship period, which meant that only the student, the teacher, and the researchers had access to students' learning diaries. The third step of the first DBR cycle was to analyse the data collected during the implementation and assess the initial pedagogical model in relation to the teaching and learning processes realized during apprenticeship.

2 Designing the initial pedagogical model

2.1 Work-based mobile learning

Mobility is regarded as the five types described by Sharples, Arnedillo Sánchez, Milrad, and Vavoula (2009). First, there is *physical mobility*. During a typical workday at a tourism company, students might shift places and spaces possibly several times a day. Learning as an apprentice takes place in bits and pieces according to the location. Second, there is the *mobility of the technology* in use. In this case, some mobility is provided by laptops that were given to students at the beginning of their studies, and that are used as a medium for reflection; students are required to write an online learning diary during their apprenticeship. Wireless local area networks (WLANs) at some tourist resorts and 3G networks offer a connection to the Internet. Third, learning is mobile in social *spaces*. During their apprenticeship period, students at TravEd Pyhä encounter learning situations that await different styles of interaction, for example, with their supervisor, colleagues, customers and the teacher. Fourth, learning is dispersed in time and in conceptual space.

The last three viewpoints reveal that this approach to learning leans heavily on the socio-cultural tradition in education (Säljö, 2004; Vygotsky, 1978). Learning is a phenomenon that cannot be isolated from the activity, culture, context, and environment in which it takes place. Technology has an important role in learning processes as a mediator of thoughts, interactions, and activity, and as a tool and mindtool (Säljö, 2004). In practice, learning takes place in collaborative learning processes. This implies that teaching or tutoring alone

does not contribute to learning, but students' own activity and the collaboration between students, teachers, entrepreneurs, colleagues, and customers at their workplace is at the heart of all activity.

This research setting is highlighted also in the informal and lifelong, life-wide, and life-deep nature of the pedagogical choices made, which are seen as vital in current research on mobile learning (e.g. de Jong, Specht, & Koper, 2008). One-third of the degree in tourism consists of an apprenticeship, which offers plenty of opportunities for informal work-based learning (Pimmer, Patchler, & Attwell, 2010). It is, however, realized that the two-year programme can provide only the basic knowledge and skills so that the students can manage their work; becoming a professional also requires learning to learn at, for, and through work (Evans, 2011). The rapid development of the tourism industry requires employees to constantly learn and reflect on new things with regard to what they have learned before. Students that now engage in legitimate peripheral participation in communities of practice (Lave & Wenger, 1991) become in the future experienced professionals who learn by example through their engagement with apprentices (Fuller, Hodkinson, Hodkinson, & Unwin, 2005).

2.2 The initial pedagogical model for WBML in tourism education

A pedagogical model is understood here as a general plan that can be used to shape curricula, to design materials for instruction, and to guide instructors' work in the classroom and other settings (Joyce & Weil, 1980). The general design and evaluation framework for this study is the pedagogical model for teaching and meaningful learning (TML) (Hakkarainen, Saarelainen, & Ruokamo, 2007) in which learning processes are defined in terms of 17 process characteristics and their expected outcomes. Pivotal to the application of the TML model is that not all of the characteristics need to be present at any given time; they can be intertwined, interdependent, interactive, partly overlapping, and synergetic (Jonassen, 1995; 2000). To create an initial pedagogical model for WBML in tourism education (Figure 1), fourteen characteristics from the TML model and two additional characteristics - situated and authentic - were selected for closer consideration.

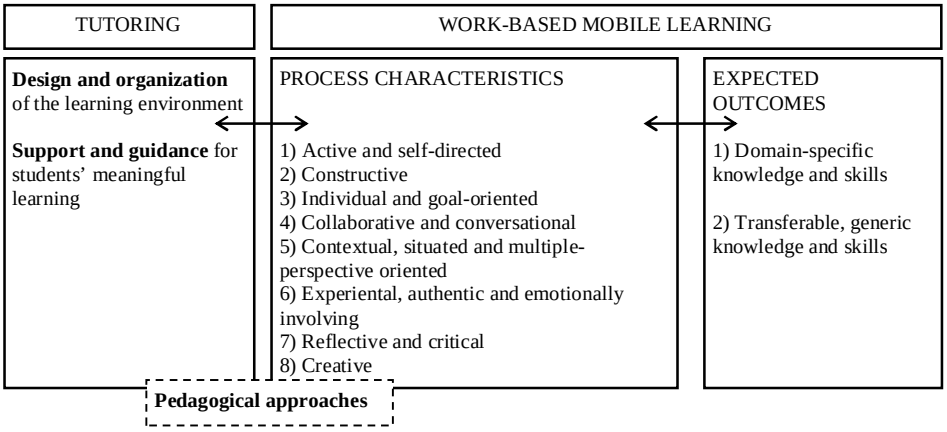

Figure 1. The initial pedagogical model for WBML in tourism education

The selection was made on the basis of general knowledge gained about tourism education and the practicalities of TravEd Pyhä tourism school, and also on the basis of assumptions made about how the apprenticeship period would be realized. Some characteristics were also grouped, if they were considered to be very close to each other and described some character of learning quite similarly. In the end, the process characteristics in the initial pedagogical model are: 1) active and self-directed; 2) constructive; 3) individual and goal-oriented; 4) collaborative and conversational; 5) contextual, situated, and multiple-perspective oriented; 6) experiential, authentic, and emotionally involving; 7) reflective and critical; and 8) creative. The details of the model — teacher's responsibilities, process characteristics, and expected outcomes — and their appearance in this particular study will be discussed in detail in the results section of this article.

3 Research question

The aims of this study were to design an initial pedagogical model for WBML in tourism education, to implement it during an eight-week long apprenticeship period, and to analyse the teaching and learning processes with regard to the initial pedagogical model. The research question of this study was: How was the initial pedagogical model and process characteristics realized during implementation from the teacher's and students' perspectives?

4 Data collection and analysis methods

The data consists of learning diaries (N=12) that students were expected to write in weblogs during their apprenticeship. Diaries included descriptions of students´ personal learning goals, plans of how to achieve those goals, tasks and duties at work, and reflections on the learned things in relation to the goals that were set before the period started. At the end of the apprenticeship period students were asked to write short reflections (minimum of 400 words) (N=9) about the apprenticeship period, which were also included in the research data.

Students were asked for informed consent (cf. Sieber, 1992) before the apprenticeship period for researchers to read their diaries and reports and to use them as research data. Data were analysed using qualitative content analysis (Gray, 2004) by systematically and objectively identifying how the elements of the initial pedagogical model - teaching, process characteristics, and expected outcomes - emerged in learning diaries, reports, and reflection assignments. The reliability of the analysis was enhanced through collaboration by the two researchers.

5 Results

In the initial pedagogical model, the teacher's responsibilities were divided into two main categories: 1) design and organisation of the learning environment; and 2) support and guidance for students' meaningful learning. Tasks that reflect the first category took place before and at the end of apprenticeship period. Before the period, the teacher's responsibility was to ensure that all students had a place to work at a workplace that offered students opportunities for achieving their personal learning goals. She also took care of making contracts with the students' workplaces and organised the final feedback discussion between the student, the workplace tutor, and the teacher. Together with the researchers, she designed the learning diary assignment and learned how to use the weblog software. Weblog training for students and the teacher was held by the researchers, who also provided technical support during the apprenticeship period. These technical support activities are not visible in the initial pedagogical model (see Figure 1), which has to be taken into account when refining the model. At the end of the period, the teacher prompted students to start writing their reflection assignments, to think about their next apprenticeship period and where they should work, and then to ensure continuing positive professional development in the field of study.

The second category included following each student's progress through blogs, giving guidance by phone calls, sms messages, and email, and commenting on students' reflections. Additionally, the teacher visited all students at their workplaces at least once during the apprenticeship period. What is also missing in the initial pedagogical model is the work that the entrepreneurs do whilst students are work as apprentices in companies. Entrepreneurs, along with their employees, have the main responsibility of tutoring students at work. This has to be taken into consideration whilst refining the pedagogical model for following implementations.

To describe WBML as an apprenticeship from the students' perspective, sixteen characteristics were selected for the initial pedagogical model. These characteristics are presented in this section as they were realized in this study. The presentation includes also quotations from students' blogs. Students' names have been changed to protect their identity.

Students were required to be *active* and *self-directed* right from the start; they were expected to independently contact a company where they would like to work during the apprenticeship period, engage in the learning process, and take responsibility for the results (Jonassen, 1995). Students themselves expected that they would learn their duties so well that they would be able to take care of them independently. Noticing that their colleagues did not need to keep as much an eye on their doings supported the development of their professional courage.

> *Today I had an opportunity to serve a customer properly in English for the first time. It was quite nice that I managed to handle it and most of the emails too all by myself.* (Audrey)

The apprenticeship was expected to offer an excellent possibility for integrating theoretical and practical knowledge into *constructive* knowledge. Some students already had some experience working at a tourism company and they were able to build on those experiences. In general, students were able to do their work tasks repeatedly during their apprenticeship, which they felt enhanced their learning.

> *[…]I didn't have to come up with things to do, but I just worked, as I would have been here for many months. Many things have become routine, but luckily you can never be the best!* (Nora)

Learning was planned to be *individual and goal-oriented* (Vahtivuori, Ruokamo, Tella, & Tuovila, 2002) as students proceeded according to their personal study plans that covered the whole degree programme and particular learning goals that were defined for the apprenticeship period. The general theme of this apprenticeship period was to learn customer service skills, and students were encouraged to define what that meant for them individually. For example, for some students it meant gaining more courage and for some it meant training to serve customers in English.

> *I know I have learned a lot and I think I fulfilled my goals well. Also my thoughts about this education became clearer, I feel like I'm on the right field.* (Mary)

For the most part, working as an apprentice requires *collaborating and having conversations* with colleagues at the company. This is highlighted especially at the beginning of the apprenticeship period, as students have to ask for guidance in many situations. Colleagues were also a source for their learning as they shared their professional histories with the apprentice. Obviously, the dialogue between the apprentice and customers also had a crucial role when practising customer service skills. After the apprenticeship period, students participated in a collective discussion session together with the teacher and researchers where they were able to exploit each other's experiences, knowledge, and skills.

> *[…] I didn't really succeed alone. Actually every time I had to call and ask for help […]* (Susan)

Contextual, situated, and *multiple-perspective oriented* were assumed to be key concepts that defined not only the apprenticeship periods, but also all education in the TravEd Pyhä School as students are in constant contact with companies at tourist destinations. Interaction with tourists during the apprenticeship period also brings out the different perspectives of customers who might have totally different cultural backgrounds.

> *[…] things that are self-evident for me are not necessarily self-evident for foreigners. Not all have a clear pattern of how to wear a balaclava!"* (Edie)

Situatedness and contextuality (Lave & Wenger, 1991) came up during the apprenticeship period in the course of students' activities and also as they served their customers; they were expected to handle situations with local knowledge.

> *The customers were very satisfied [in] hearing the facts and history regarding Salla field.* (Jack)

A contextual approach also affords possibilities for *experientality, authenticity,* and *emotional involvement,* which can make learning situations successful for students (Poikela, 2006; Soini, 1999). It was realized that learning as an apprentice was based around authentic tasks that engaged students in exploration, inquiry, and social discourse (Traxler, 2009). For most, the beginning of the period was an exciting and sometimes a scary experience, because they felt they lacked the language and customer service skills needed in their daily duties. After gaining some experience and managing challenging situations, they built up their courage and were able to more openly take responsibility in their work. Having the feeling of being needed and useful at work was very important.

> *I got very tensed. Only Brits for dinner, I just hoped that they wouldn't order or come to ask anything. A futile hope.* (Ann)

> *I like working at [name of a company] and it feels like I am actually useful and helpful there.* (Nora)

Positive emotions are vital for learning, as is the *reflection* that was realized in students' learning diaries and reflective summaries about the period, and attending the feedback discussion with the teacher and the tutor and the collective discussion session. Reflections appeared in students' diaries frequently especially as the apprenticeship period was about to end. It was joyful for them to notice their own development in customer service, languages, and knowing different cultures. Becoming aware of their own improvement and assessing their own skills critically supports their professional identity.

> *It's nice to think how I have developed from the beginning of the apprenticeship. […] At first I learned by observing. Then little by little it changed to learning-by-doing.* (Mary)

Creativity, which can enable students to reach higher levels of meaningful learning (Novak, 1998), appeared when communicating with a foreign language, developing new products, designing marketing material for the companies, and arranging occasions.

> *The most special and maybe the most challenging customer serv[ice] situation was communicating with deaf-mute Russians.* (Lisa)

During the apprenticeship, students were expected to gain domain-specific knowledge and skills as well as transferable and generic knowledge and skills. To evaluate their learning, students were required to complete a competence-based qualification concerning customer service during their apprenticeship period. However, the completion was postponed to the second apprenticeship period, which made the assessment of learned skills in relation to the initial pedagogical model somewhat difficult. On the basis of students' diaries it nevertheless can be identified that domain-specific knowledge included local knowledge of the tourist destination at which they are working, customer services skills, production of tourism services skills, and knowledge about what kinds of tourists would come to a specific destination. Transferable and generic knowledge and skills included language and ICT skills.

> *[…] I can make tickets with Skidata, which at the moment is the most commonly used type of ticket in Finland, so it's good to know that if I'll work also in other resorts.* (Ross)

There were big differences between students in the frequency at which they posted to their blogs. For some students, it seemed natural and easy to write about their activities, thoughts, and reflections about their learning. For some, the writing task was not so easy or motivating, which resulted in an empty weblog, regardless of personal advice and tutoring they received by email and support from the teacher and the researchers. Some students also had difficulties in accessing the Internet to update their blogs due to the facilities in their accommodation during the apprenticeship. Some students commented in their reflection assignments that the smartphones that they had planned to acquire for their use could have made a difference in their blog writing activity.

> *I hope that the phones […] would make this easier. I wouldn't be this dependent on the laptop and Internet at home as I could basically carry them with me.* (Daniel)

6 Conclusions

There is already a solid tradition of research on mobile learning and the affordances of mobile devices for learning. However, specialized pedagogical models that create a framework for practitioners in different areas of education that exploit mobile technology are still needed. This paper has presented the first steps of designing a pedagogical model for WBML in tourism education.

Although the first apprenticeship period was mainly successful, there were big differences between the students in the frequency of their blogging activity. One reason for the low activity was a lack of possibilities for accessing the Internet during and after work hours. Other reasons were mostly motivational. Accessibility problems could be addressed by increasing the mobility of technology (e.g. by providing smartphones for students), but one also needs to consider how students' motivation for blogging could be increased. According

to Pena-Shaff, Altman, and Stephenson (2005), one way to do this could be to open students' blogs to other students and encourage them to comment to each other's posts. Regarding this first implementation, it was considered most important that all students were able to open their blogs, get to know blogging, and write a reflective learning diary, but it was acknowledged that interactivity would also enhance the collaborative and conversational characteristic of learning.

In the next implementation the interactive part of blogging will be addressed. It is expected that having the first learning diary and personal learning history available would make it easier for students to reflect on the things that they have already learned and to set learning goals for the next period. For the second apprenticeship period, students and teachers will be equipped with smartphones. It is anticipated that they might support better time management and active communication between students as well as the mobility and experientiality of the learning experience. It is possible that easier note-taking (e.g. through digital pictures, videos, or voice recordings) will also lead to more frequent updates in students' learning blogs, which might make it easier for students to reflect on their learning. The results of the analysis done after the first implementation suggest two main refinements to the initial pedagogical model. The refined pedagogical model is presented in Figure 2.

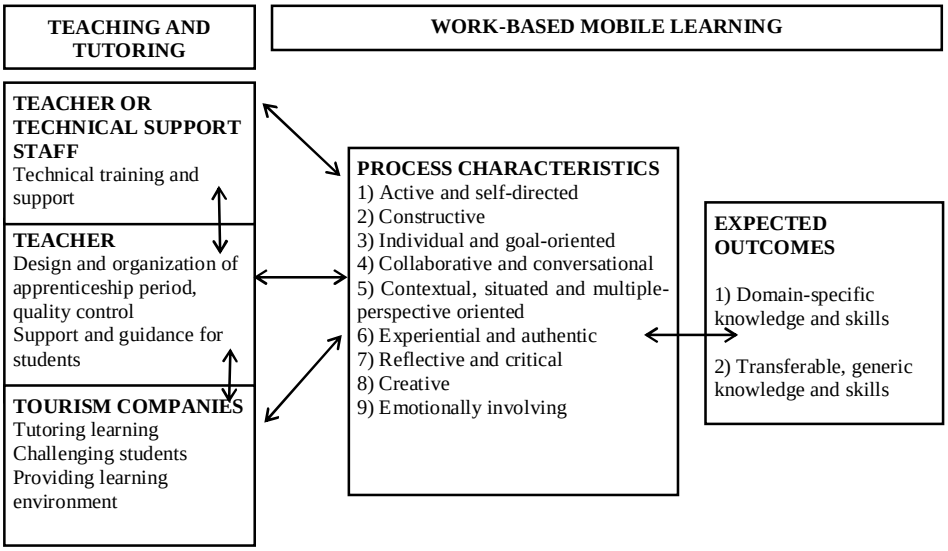

Figure 2. Refined pedagogical model for WBML in tourism education

First, the initial pedagogical model does not take into consideration the involvement of the tourism companies in the apprenticeship period. Entrepreneurs and their employees tutor students' work during apprenticeship periods. This commitment needs to be made visible in the pedagogical model. The role of entrepreneurs is to challenge students to learn by providing tasks that are demanding enough, giving responsibility when it is possible, taking care of the versatility of students' work, and guiding students in problematic situations that can be the most educational ones. The second refinement is adding technical support to the model. During the first apprenticeship period researchers did this, but in the future, the provider has to be someone else as the researchers are not involved in the education after the projects end. The responsible teacher could be trained to use different kinds of social media tools well enough to be able to apply them into his/her teaching, or technical support staff at the educational institution could be included more deeply into the teaching and learning processes.

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ICT and Mobile Technologies in Teaching and Learning

Interventions in Higher Education: Re-interpreting the Concept of Learner Control

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Contemporary interpretations and applications of the concept of learner control as an expression of self-direction in formal higher education appear to be too restricted and ignore the wide-spread invasion of digital technologies that increasingly restructure and mediate all kinds of human activities. The paper attempts to find ways to expand, reinterpret and adapt the current concept of learner control to the ongoing development in the digital realm. It examines how one can intervene into existing teaching and studying practices to primarily encourage and promote increased learner control in technologically mediated settings and secondarily to support the potential advancement of dispositions for self-directing intentional learning projects. Following a design-based research approach three intervention studies were implemented into existing higher educational settings. The intervention studies demonstrated existing practices can be successfully redesigned and reconfigured to maximise learner control and responsibility while making systematic use of digital technologies. A list of intervention design guidelines is abstracted and condensed, that provides some orientation knowledge of how to avoid a number of re-occurring problems and obstacles that regularly emerge if one intervenes into current practices with the aim of fostering learner control.

Keywords: learner control; self-directing intentional learning projects; educational intervention

1 Introduction

The rapid pace of technological change and accelerated growth of knowledge are confronting individuals more and more with the need to acquire necessary dispositions for self-directing their intentional change (Rychen, 2003). There is a need for individuals who are able to take responsibility for what they choose to study and to select, construct, and manage their own learning environments under rapidly changing societal conditions, often without the cumbersome apparatus of educational institutions (Candy, 1991).

The way higher education has responded so far to the rapidly changing demands from society and the transformative power of global digitalisation and networking has been often criticised as a rather limited and relatively unimaginative view on how digital technologies can support existing teaching and studying practices. Instead of focusing on digital technologies as a fundamental innovation from technological, economical and social points of view, higher education has been mainly trying to preserve and duplicate previous forms of educational practices through new technology (Attwell, 2007). Contemporary interpretations of the concept of learner control appear to ignore the extensive invasion of digital and networked technologies that increasingly restructure and mediate all kinds of human activities. Previously undertaken studies on the notion of learner control in higher education have regularly overlooked and underestimated the importance and potential of digital technologies for expanding the understanding of the very concept. A re-interpretation and expansion of the notion of learner control and its explicit connection with the ongoing development of digital instrumentation from a conceptual and practical point of view is required.

This paper aims at primarily examining to what extent and in what ways the current concept of learner control should be expanded and adapted to the ongoing development in the digital realm. Secondly, it investigates how one can intervene into existing teaching and studying practices to encourage and promote increased learner control over crucial instructional components in technologically mediated settings in higher education.

2 The notion of learner control in formal higher education

Learner control as an expression of self-direction in formal instructional settings is defined as a fundamental and comprehensive shift of control and responsibility towards an individual learner (or a group of learners) in relation to a continuum of critical instructional components. The way formal higher education is normally structured and conducted allows for only a rather limited degree of learner control and responsibility over all the significant components at once (Merrill, 1984). In most formal instructional and training settings a learner is permitted to take control over a relatively narrow range of choices which are pre-selected alternatives consciously limited by an educational authority (Geis, 1976). The figure 1 illustrates this kind of situation.

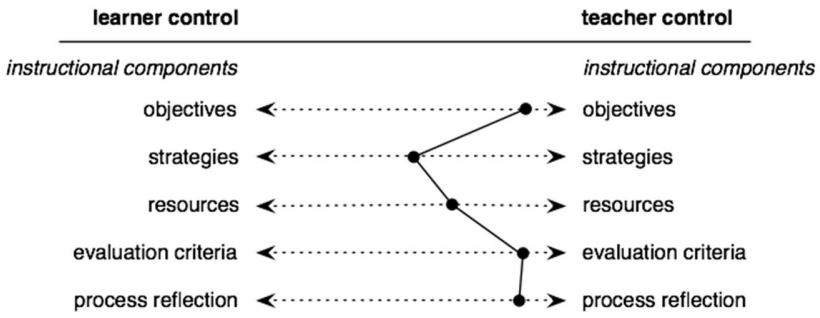

Figure 1. An illustrative example of instructional components controlled by teachers and learners

The list of instructional components represents a set of crucial components that were extracted from various contributions (Dron, 2007; Geis, 1976; Hiemstra & Sisco, 1990; Knowles, 1975). This selection of instructional components embraces core aspects of what is generally used to design instructional episodes. On the other hand it is also in alignment with a general understanding of what characterises self-directed learning (see Knowles, 1975) and defines an ideal "anatomy" of an intentional learning project. Diagnosing learning needs, setting up objectives, selecting appropriate (action) strategies, identifying various potential resources (people, various artifacts, tools, etc.), evaluating expected outcomes, and carrying out a critical reflection on the entire learning process, represent a whole continuum of components that should be ideally under the control of learners.

With the emerging digital technologies the range of resources for supporting one's learning process is increasingly growing. It is obvious that digital technologies provide unlimited opportunities for individuals to independently explore areas of their interest, thus, holding a considerable potential for supporting and encouraging learner control. Digital technology in general and networked tools and services in particular offer an ever growing selection of instruments for the (re-)mediation of learning activities. Various implementations of different digital technologies within educational settings to explicitly increase some aspects of learner control have been carried out (See for example (Li & Soh, 2003; Lunts, 2002; Opfermann, Gerjets, & Scheiter, 2006; Papanikolaou & Grigoriadou, 2006; Song & Hill, 2007)). However, a recent meta-analysis done by Stubbe & Theunissen (2008) shows that the studies actually allowed only for rather limited levels of learner control. While existing patterns seem to be widely replicated with digital technology, the option to promote learner control over a broad range of instructional components, or digital instruments in particular, is generally either not considered or purposefully ignored.

The most recent attempt to explicitly connect some aspects of learner control with digital technological developments is the discourse around the concept of *personal learning environments* (Attwell, 2007). Usually the concept carries the idea to provide learners with a predefined set of tools and services and hand over the control to the learners to select and use them in the way they deem fit (See for example (Amberg, Reinhardt,

Haushahnand, & Hofmann, 2009; Barrett & Garrett, 2009; Godwin-Jones, 2009; Henri, Charlier, & Limpens, 2008). However, a mere shift of control from a teacher to a learner over a pre-selected set of technology does not necessarily mean increased learner control over their entire learning experience. Yet, why should technological means be pre-defined and pre-selected for adult learners while taking control and responsibility for their intentional learning projects?

3 Expanding the concept of learner control

The expanded concept of learner control emphasises a comprehensive and concurrent shift of control and responsibility on the full range of crucial instructional components from a teacher to a learner (Figure 2). Shifting control and responsibility to learners means also the elimination of intentional boundaries, constraints and pre-selections (for instance teacher selected materials to choose from) that prohibit learners from taking absolute control and responsibility.

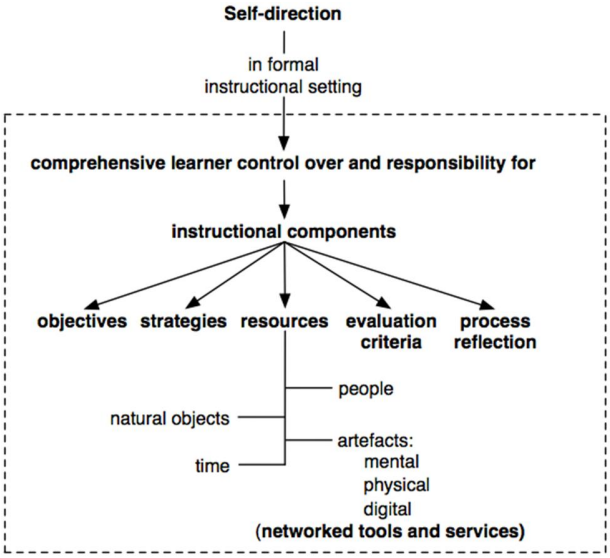

Figure 2. Expanded concept of learner control

A special focus in the expanded concept of learner control is put on resources. Resources can be divided into the categories such as people, natural objects, time and various mental, physical and digital artefacts. While the set of instructional components outlined in Figure 2 represents typical steps a self-directed learner undertakes while working on an intentional learning project, digital instrumentation option of (learning) activities brings in another emerging instructional component within educational settings. Finding, selecting and turning appropriate networked tools and services into instruments together with other resources to support one's intended learning project is a clear expression of controlling and being responsible for one's learning project and its perceived personal learning environment.

4 Research design and methodology

The outlined, expanded concept of learner control was taken as a basis to guide the intervention design and implementation process through iterative cycles with the purpose to re-organise and re-mediate current formal higher educational teaching and studying practices in a way that create constraints and challenges for participants. These constraints and challenges were expected to contribute to the creation of new roles and changing relationships; increasing opportunities for shifting control and reconfiguring responsibilities,

displacing existing activities and behavioral patterns as well as redistributing and transforming resources. The constraints and challenges were created through:

- pedagogical approach in which learners were put in the centre of a learning experience and were encouraged to take initiative over their learning projects.
- technological instrumentation option of learning activities as an important inclusion in the expanded concept of learner control.
- technologically mediated communication and interaction with peers and facilitators.
- (distant) collaboration activities, in which learners perceive the need for finding, negotiating and selecting the most appropriate technological means for supporting their collaboration activities.
- re-organising assessment procedures focusing on self- and peer-assessment, which allow to be compatible with the overall shift of control and responsibility.
- procedural support tools to help learners structuring and externalising their intentional learning projects to monitor their progress, learning trajectories and paths.

This research as a whole embraced a combination of methodological elements inherent to the design-based research approach (The Design-Based Research Collective, 2003). It consisted of 3 individual intervention studies, which aimed to observe, map and understand the dynamics and consequences of the interventions and find out whether the intervention design is viable and applicable in a formal higher educational setting. Through multiple cycles of analysis, design and development, the intervention design was improved and adapted to the contextual constraints that characterised the particular implementation settings. A combination of research instruments and multiple data sources were used to document the various stages of the intervention studies. Mainly a direct elicitation method focusing on intrapersonal data (cognitive and emotional aspects of the participants' experiences, thoughts, feelings, challenges, attitudes) was used for data gathering (Breakwell, Hammond, & Fife-Schaw, 2000) in the form of:

- semi-structured online and face-to-face interviews with the participants;
- content collection (text and schemes) from the participants' Weblogs, e-mails and personal learning contracts;
- digital traces in the participants' individual and common Web-based workspaces, and various networked tools and services they had used during the interventions;
- recorded audio-video meetings of the participants;
- open-ended questionnaire with the participants.

These data sources were combined and qualitatively analysed with techniques by Miles and Huberman (1994). The data analysis followed mainly a top-down approach in which data was initially coded according to its set of a-priori-codes that were derived from the research questions together with sub-themes that emerged within these categories. The codes were gradually elaborated by bringing in additional themes as sub-themes while working with the data. In addition, a content analysis (Wolcott, 1994) was done to understand concrete challenges, barriers and contradictions for interventionists that occurred in the context of these intervention studies.

Intervention study I was conducted as a first cycle of the overall design-based intervention research. Intervention design was implemented into the teaching and studying practice of formal higher educational setting. The study involved 24 master's level students and two facilitators from Tallinn University, Estonia. The study focused on the students' comprehension of their personal learning environments complemented with digital technology and their perception of the affordances of their environments.

Intervention study II was targeting one of the master level courses provided by the Institute of Informatics at Tallinn University, Estonia. It explored on how students acquired some expertise regarding the selection and combination of a diverse set of technological means for one's own purposes. It aimed at finding out students' experiences and expectations regarding the overall course and the role of facilitators in particular; their challenges and difficulties in this course; their understanding of self-directing intentional learning projects; and their previous and prospective use of networked tools and services for study or work. 26 students and 2 facilitators participated in the second intervention study.

Intervention study III was carried out in a more complex international context. 10 facilitators and 77 students from different countries participated in the third intervention study. First, this study focused on facilitators' experiences, attitudes, and thoughts regarding their facilitation styles and strategies in such a setting. Secondly, this study aimed at exploring students' challenges and attitudes towards increased learner control and their experiences of forming a landscape of networked tools and services for supporting their study activities.

Because of a limited space here, for a more detailed description of the individual intervention studies take a look at (Väljataga, 2009a, 2009b; Väljataga & Fiedler, 2009; Väljataga & Laanpere, 2010; Väljataga, Pata, & Tammets, 2010).

5 Intervention implementation challenges and barriers

Properties of a particular intervention design are often subject to the eye of the beholder and therefore may be understood differently by different participants (facilitators, students), based upon their position, role and experiences. An extensive qualitative data gathering and analysis allowed inferring challenges and barriers from the perspective of an interventionist. These challenges and barriers were mainly related to the participants' understanding and perception of the nature of the expanded concept of learner control and what its implementation means in practice. The following list below summarises potential re-occurring challenges and barriers:

- different levels of commitment regarding participants' readiness and willingness to actively participate in the intervention;
- different interpretations of the intervention objectives, its rationale and benefits;
- different interpretations of the changing roles participants are expected to take during the intervention;
- different interpretations of what actions can be, should be and have to be carried out during the intervention;
- tendency to conserve well-known roles and to fall back to old patterns of actions;
- negative attitudes towards the use of networked tools and services;
- different levels of participants' knowledge and skills regarding the use of networked tools and services in educational practices;
- different interpretations of what resources in general and networked tools and services in particular to utilise for supporting teaching and studying practices;
- resistance for accepting new cultures that networked tools and services bring along (openness, transparency, privacy, etc.);
- resistance to accept changed evaluation and assessment procedures;
- difficulties to understand and perceive the purpose and benefits of support tools but also inability to implement support tools adequately and efficiently.

Intervening into a system always triggers resistance and avoidance among participants. This should not be interpreted as an accidental disturbance that needs to be avoided (Hawe, Shiell, & Riley, 2009). Challenges and barriers should not be treated as a weakness or a sign of failure. On the contrary, they actually demonstrate that the intervention design and its implementation have successfully managed to interrupt current routines in teaching and studying practices. Any challenge or barrier should be considered as a basis to orientate the interventionist's search for desired change (Foster-Fishman, Nowell, & Yang, 2007). It is absolutely normal that many participants tend to adapt to a new situation by replicating their previous trusted patterns of action.

6 Intervention design and implementation guidelines

The aforementioned challenges and barriers can be avoided or at least reduced. The list below summarises intervention design and implementation guidelines. The guidelines are roughly divided into two parts: investigating the intervention feasibility in the potential target setting; and designing and implementing the intervention. The list aims at specifying the processes and the involved people; and providing systematic tasks that directly or indirectly respond to the typical challenges and barriers while maximising learner control. Following the guidelines presented in the list can be seen as a mechanism for ensuring at least partially that the intervention design and implementation process progresses efficiently, addresses some of the essential issues and insures that goals are met and constraints are observed.

Investigation of intervention feasibility

- **Analyse potential target setting** - A complete understanding of the characteristics of the setting helps to avoid surprises and repercussion during the intervention implementation, but also defines the nature of the intervention design decisions.

- **Engage, negotiate and collaborate with educational representatives** - Collaboration with decision-making authorities helps to arise interest and engagement in an early stage. Achieving consensus has a great influence on the proper intervention implementation.

- **Engage facilitators as change agents already in preliminary planning process** - It is important to get facilitators fully on board with a high level of personal commitment and engagement, to reach consensus regarding intervention objectives, changing roles and responsibilities. A special training for facilitators on new tools usage, intervention principles and techniques is recommended.

- **Communicate new terminology, roles, and responsibilities** - Familiarise participants with the intervention purpose and explain its benefits in order to achieve a compatible understanding.

- **Compare initial intervention design with the potential target setting** - As a minimum set of requirements should be fulfilled to repeat the intervention approach one has to engage and negotiate with educational representatives an adequate range of freedom in respect to typical higher educational contextual constraints.

Intervention design and implementation

- **Eliminate tempting elements** - It is important to eliminate elements from the intervention context that may provide opportunities to fall back into known patterns of actions. Some of them might show up during the intervention implementation process.

- **Provide different tasks** - Binding individual tasks with collaborative activities might widen the understanding and perceptions of affordances of technology. Embed new intervention related concepts and challenges into domain-related knowledge and activities.

- **Provide a set of preselected networked tools and services** - It might be worth to "seed" a preselected set of networked tools and services as a starting point. Another option is to allow some time to teach some of them in the beginning, and to show examples of how they can be used, for what purposes and in what context.

- **Provide supportive means for shifting control** - Support tools such as visual representations, learning contracts, etc. can help to explicate one's intentional learning project and environment.

- **Be aware of facilitator functioning as "models" for participants** - Students tend to copy facilitator's choices regarding the selection of networked tools and services or the ways the course is supported by technological means.

- **Allow participants time to get used to the new situation, roles and responsibilities** - Gradually obtain awareness of participants' activities and landscapes of technological instruments. Participants should be granted with some extra time to accept new roles and responsibilities. Distribute domain-related tasks.

- **Do not overload participants with new concepts in the beginning** - Allow gradual implementation of new concepts and technological tools. Reduce domain related tasks in the beginning.

- **Provide constant conversation and feedback** - Constant monitoring and commenting is essential in distributed and open environments. It shows appreciation of participants' efforts and increases the likelihood that they perform again.

- **Be flexible** - One should be ready for unexpected quick successes and failures. Be aware that resistance and subversion are not accidental disturbances that need to be avoided by all means. An intervention design should be subject to negotiations and allow participants themselves to shape the overall intervention.

The aforementioned list of guidelines should be interpreted as orientation knowledge while attempting to design and implement similar intervention studies. Having an all-encompassing overview of the target setting and the potential participants involved is the most critical starting point. To build a systemic picture the implemented intervention has to be rooted in multiple perspectives and investigated from different participants' point of view. Facilitators as change agents are the driving force in the application of such an intervention design and implementation. It requires a shared vision in which the facilitators both believe in what they are doing, but also pay close attention to negative results (Bereiter, 2002). Intervention viability depends greatly on the success of collaborating with the participants and reaching consensus in terms of intervention objectives, its benefits and commitment requirements. The second group on the list focuses on the specific aspects that should be considered while starting the interplay between intervention design and particular contextual constraints. The list provides aspects that might help to avoid or reduce typical challenges and barriers described before.

In conclusion, quality of the intervention is denoted by the researchers' skills in flexibly response to the emerging demands of the research, changing situational variables, features of the setting; and systematic understanding of the change dynamics in a particular intervention context. Yet, designs in education can be more or less specific, but can never be completely specified. The effectiveness of innovative design in one setting is no guarantee of its effectiveness in other settings (Collins, Joseph, & Bielaczyc, 2004).

7 Concluding remarks

The paper has contributed to the field by explicitly relating the ongoing development in the digital technological realm to the concept of learner control and by treating networked tools and services, as an important component for maximising learner control and responsibility. By acknowledging the complex nature of formal academic learning, this research has demonstrated the need for such an expansion of learner control to support the advancement of more general dispositions for self-directing intentional learning projects in technologically rich environments. Promoting change through targeted interventions into a complex educational system with its long history is a challenging task. This is even more so if the interventions are carried out within rather limited time frames. The intervention studies carried out on the context of this research project exemplify a feasible and effective way to put participants into situations where they have to take control over instructional components and responsibility for their decisions in technologically mediated settings. The paper indicates a promising starting point for developing successful intervention strategies and design guidelines on how to reconcile conflicting interests in formal higher education, develop a common sense of purpose among involved

participants, and mobilise support from educational authorities. In order to comprehensively understand the intervention process and its impact on all actors involved, the research has showed the need for a careful examination of contextual constraints, the processes a particular system undergoes, and the strategies that actors implement to either appropriate, manipulate, or even subvert intended intervention designs.

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Concept Mapping in Visual Arts Lessons

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Educational institutes need pedagogically grounded methods to properly integrate Information and Communication Technologies (ICT) into learning processes. Concept mapping software can provide this and more, because it is based on learning through conceptual changes and offers the possibility of collaborative knowledge construction. The powers of the concept mapping method and software are yet to be implemented in the Finnish education system. The study presented in this paper is about a case study where 11 Finnish secondary school students were introduced to utilizing concept mapping software as a tool in their visual arts lessons about National Romantic style. Each student's ability to construct maps was evaluated. The possible correlation between reading skills and the ability to construct maps were studied as well as students' perception about using the software. The results show that secondary school students are able to construct well designed concept maps, found the software to be user friendly, and perceived the method of concept mapping to be useful in promoting their learning.

Keywords: concept map, e-learning, software, school, student

1 Introduction

The learning outcomes of Finnish comprehensive schools were found to be excellent in PISA's (Programme for International Students Assessment) international comparison studies carried out by OECD (Organisation for Economic Co-operation and Development) member states. Organization of schoolwork and teaching in Finland is guided by a pupil's own active involvement and interaction with teachers, fellow pupils, and the learning environment. Pupils process and interpret the information that they absorb based on their prior knowledge structures. The national core curriculum of Finland (2004) has been formulated on the basis of learning as an individual and community process to build knowledge and skills. The theoretical framework of the national core curriculum is based on social constructivist learning theories. The theoretical framework that supports the use of concept mapping is consistent with constructivist epistemology. Concept maps are graphical tools for organizing and representing knowledge (Novak & Cañas, 2008). Novak and Gowin (1984) developed the idea of using hierarchal concept maps as a tool for evaluating the development of concepts in a learning experience. Concept mapping can be seen as a method of visualizing the structure of knowledge, sometimes compared to the structure of long-term memory (Asan, 2007).

With the rapid development of Information and Communication Technologies (ICT), a number of computer-assisted concept mapping systems have been introduced, finally making it possible to work with concept maps fluently both individually and collaboratively, with the latter creating new possibilities for knowledge construction within a group of experts. In Finland, however, the development of utilizing ICT in teaching, studying, and learning processes in a pedagogically grounded manner has not advanced alongside technological advances; teachers most commonly use ICT for administrative tasks (Sipilä, 2010). In order to use ICT in formal teaching through the modern conception of learning as a social constructivist activity, teachers should use student–centered approaches in their teaching. This is where concept maps would have an important role; it is imperative to obtain more knowledge about how students react when their traditional learning styles are influenced by introducing a new way of conceptualizing and constructing knowledge.

The following research provides an insightful look at the learning experience of a group of secondary school students (N=11) as they were taught to use the Institute of Human and Machine Cognition (IHMC) Concept Map (Cmap) software and guided in utilizing the software in their visual arts studies. These students were chosen based on voluntarily participation in a visual arts course as a part of their 9th grade studies. The teacher of the course was acquainted with the concept mapping method and was able to use concept mapping software in her teaching. IHMC Cmap Tools-software is developed by the Florida Institute of Human and Machine

Cognition. The software is designed to build any type of relational charts, concept maps and other types of diagrams. It can be used free of charge and is localized to several languages, including Finnish. Students were instructed to construct a concept map individually based on selected reading material. Another assignment was to build a concept map based on lecturing, text, and a game on the Internet. Their success in constructing maps was evaluated by comparing their results to their score in a reading comprehension exercise, and by comparing their individual maps to an expert map constructed by their teacher. Finally students' reactions and thoughts about the use of concept mapping in their learning were gathered in an online questionnaire.

2 Theoretical background of concept mapping in knowledge construction

The idea of mind mapping has been present in basic Finnish education for a long time. However, mind mapping and concept mapping differ in their use and usefulness for learning. The former is based on radial hierarchies and tree structures denoting relationships with a central governing concept, whereas concept maps are based on connections between concepts in more diverse patterns. Mind mapping can be taken into teaching and learning more flexibly, whereas concept mapping needs more input from the teacher and learner in order to get the most out of using concept mapping.

Novak and Cañas (2008) define concepts as a perceived regularity (or pattern) in events or objects, or records of events or objects, designated by a label. Competence in a domain of knowledge is defined by knowledge that has a highly integrated structure around central concepts (Glaser & Bassok, 1989). Martins (1994) defines concept mapping as two-dimensional representations of cognitive structures showing the hierarchies and interconnections of concepts involved in a discipline or sub discipline. Concept mapping was originally based on Ausubel's theory of meaningful learning. Ausubel worked on how one learns large amounts of useful information from textual and verbal inputs. Ausubel's subsumption theory is based on the premise that the acquisition of new knowledge is dependent on what is already known (Ausubel, 1968).

Externalization of knowledge supports information processing because the externalized model can be used as external memory and as an additional source for information processing (Hanke, 2006). Concept mapping has been found to be a supportive learning method that promotes thinking processes, problem solving, and information recall (Nesbit & Adesope, 2005; O'Donnell, Dansereau & Hall, 2002). MacKinnon (2009) found concept mapping to have great potential for stimulating critical thinking and conceptual change, and that the pedagogical context in which it is used has great importance on its success. Concept maps promote students' understanding and have a positive effect on their thinking skills as it makes the knowledge construction process visible (Ligorio, 2001). Presseisen (2001) lists five basic skills in enhancing complex thinking: qualifying or identifying basic units and facts, classifying, finding relationships, transforming the known to a unique metaphor or analogy, and drawing conclusions such as causes and effects. These underlying skills are applied to higher-level thinking processes such as problem solving, decision making, and critical and creative thinking (Oliver, 2007). Highly structured maps may only require students to identify existing knowledge, maps with pre-selected terms may lead students to build on existing knowledge with new relationships and structures, and open-ended maps may lead students to generate new knowledge (Tergan, 2006).

The theoretical framework of this study is based on Gadamer's (1979) conception of understanding to be a process of the 'fusion of horizons', which involves the formation of a new context of meaning that enables integration of what is otherwise unfamiliar. Understanding and interpretation always occurs from within a certain 'horizon' which is determined by our historically-determined situation (Malpas, 2009). In Gadamer's view, understanding is essentially a matter of conceptual articulation where the primacy is given to language and conceptuality. Language is about communication. It is about transferring, aggregating and processing information. The ability of language to perform these functions depends on the skill with which its users understand each other in any particular case. The study presented here will mainly focus on investigating the ability of secondary school students to adopt new information into their personal 'horizon' by reading text – based material and from given lectures from a topic that is already familiar to them in general (National Romantic style) but containing quite a lot of in depth new information about it. Transforming what students learn during the process into a form of a concept map that can be edited and extended, the students should be able to better recognize sequences, classify terms, and externalize their new ideas and thoughts based on their existing knowledge.

3 Research questions

The research questions of the study are as follows:

- How well do students succeed in constructing concept maps from written material and lectures and how do their maps differ from a map constructed by an expert?
- How does a student's ability to understand reading material affect their ability to construct concept maps?
- How do students perceive and experience the use of the concept mapping method in their learning?

4. Method

The research presented in this paper is based on the mixed method research model. The intent is to create and then evaluate changes in the way technology is used and how the use of concept mapping in learning is regarded by students. Observation of students, analyses of personal documents, and semi-structured interviews were chosen from the ethnographic research strategy.

The subjects of this research consist of a group of 11 9th grade secondary school students; age 15, who had all chosen a course in visual arts as one of their voluntary courses. None of the students had prior experience with the software used or had been instructed in how to construct concept maps. The idea of mind mapping was familiar to them. The group's visual arts teacher had participated in a course about concept maps and knew how to use CmapTools–software in teaching.

The qualitative part of the case study was employed during a one month time period, over which the students learned to use the software. Through the teacher's eight lessons, they came to understand the basics of concept mapping by constructing a map with some super ordinate terms from a given topic and studying the given assignments. The researcher's role was that of an on-site participant-observer during those lessons.

The reading material that was used in the first assignment, where students were told to construct a concept map based on the text, was edited from a text excerpt taken from a schoolbook about folk art. In this exercise, students were given a map template with some preselected terms already inserted. Their assignment was to continue constructing the map; a scaffolding method to help them get started. The main subject, National Romantic style, was covered during the lessons when their teacher first taught students about the subject, then guided them to play through an edutainment game on the Internet about the subject and given extra reading material about the subject from a certain web address. In the final lesson, students were asked to complete a reading comprehension exercise. The subject of the text in the exercise was not related to the actual topic of National Romantic style. Their last assignment was to take part in an online questionnaire, where they were asked about their opinions concerning utilizing concept mapping technology as a means of learning.

5 Analysis

The content analysis of the students' concept maps was executed by comparing their individual maps with an expert map conceived by the visual arts teacher. As the subject being learned covered four different main topics with several subtopics, these were color-coded with four different colors by the teacher when found. In the second phase the teacher looked at the maps more carefully, identifying to what extent the student had managed to cover the topics and whether the student had managed to discover and link the main topic with the subtopics. In the last phase of analyzing student maps, the teacher concentrated on finding cause and effect relationships between different concepts. After the analysis, the teacher graded the maps on the four to ten scale normally used when grading tests in the Finnish education system.

Map grades where compared to the student's score on the reading comprehension test in order to discover whether their reading comprehension ability was in any way connected to their ability to construct concept maps. All the student data was handled anonymously. Students were identified only by a code in order to make the necessary connections between the reading comprehension test and the individual concept map. In the last

stage the students' replies to questionnaire, which used the Likert scale and open-ended questions, were analyzed in order to learn how students perceived the use of concept maps in the learning process.

6 Results

The first research question of this study asked how well students succeed in constructing concept maps from written material and lectures and how do their maps differ from a map constructed by an expert. The map presented in Figure 1 below reveals different color codes, superordinate/subordinate terms, and relations between them as constructed by the visual arts teacher. These were used to categorize the different elements that were later used in reviewing student maps.

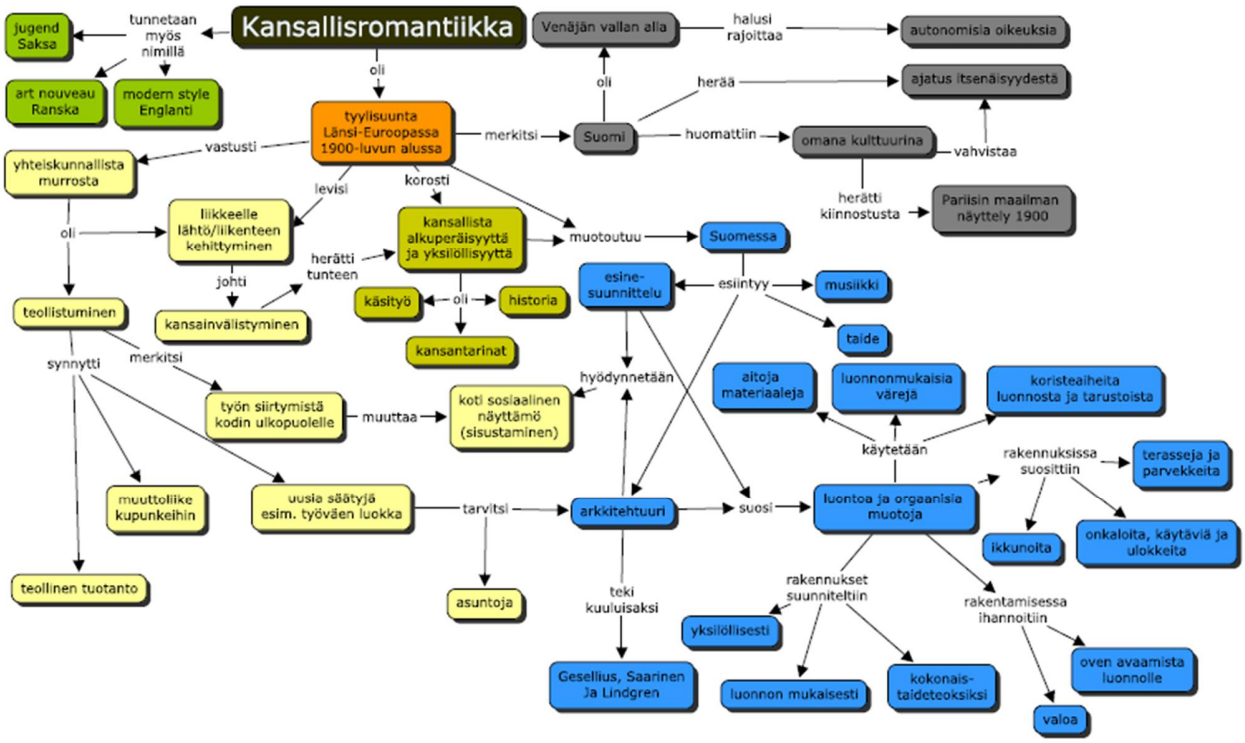

Figure 2. Expert map constructed by the teacher.

Of the 11 students, 27.5% managed to receive an excellent grade (9 or 10) from the concept map review, 45% performed well (7 or 8), and 27.5% performed poorly (5 or 6). There was a great variance in the quality among the maps created by the students, which is demonstrated in Figures 3 and 4 below.

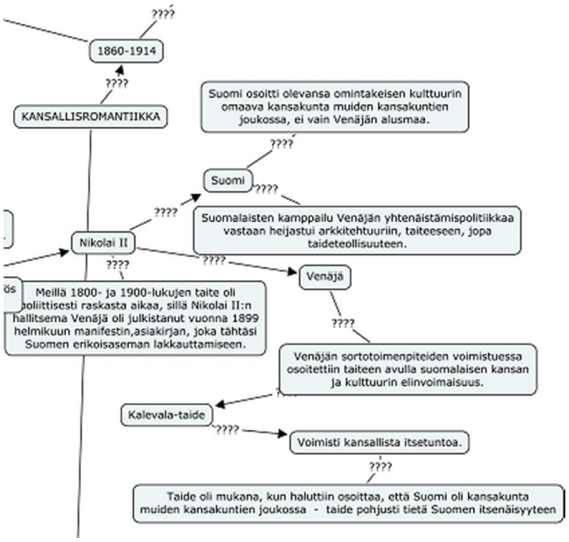

Figure 3. Poorly constructed map.

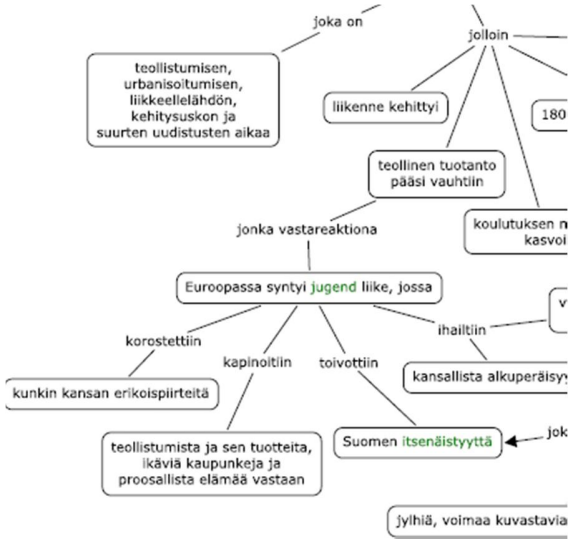

Figure 4. Well designed map.

Figure 3 shows a part of the map where the student has not managed to produce linking words between concepts and has copied sentences from the source material into the boxes. This map as a whole was not logically constructed or organized. This student did not perform well in the reading comprehension test. Figure 4 part of the map of a student who understood how to use linking words between concepts, create a map that is logical in its structure, and is easy to comprehend. This particular student performed well also in the reading comprehension test.

The results of the analysis indicate that secondary school students are able to construct well designed, logically constructed concept maps with topic interrelations. Utilizing concept mapping software makes constructing maps with superordinate/subordinate terms and linking words easy; but also emphasizes the fact that students need to work on the subject and understand it thoroughly in order to succeed in constructing a good concept map.

The second research question of this study asked how a student's ability to understand reading material affected his/her ability to construct concept maps. Table 1 below lists individual student scores from the reading comprehension test and from the concept map assignment, as well as mean values.

Table 1. Individual student scores from reading comprehension and concept map with mean values.

ID	Reading comprehension 1-10p.	Concept map 4-10p.
01	7	6
02	4	5
03	6	8
04	4	7
05	3	7
06	2	8
07	4	6
08	7	10
09	7	10

10	6	9
11		7
Mean	5.00	7.55

When all of the ten participants in both columns above were categorized into two groups based on their performance, performing well on the reading comprehension test correlated with succeeding in concept mapping at a rate of .56. This would indicate that reading skills are related to one's ability to construct concept maps, but the small sample size does not permit generalizations and was not the intention of this study.

The third research question of this study asked how students perceived and experienced the use of the concept mapping method in their learning. One of the respondents was not present during the lesson when the students took part in the online questionnaire, but the remaining ten respondents found using concept mapping as a learning method to be a positive experience.

Table 2 below shows the mean value of respondents to eight statements. the students were asked to reply by choosing the option that best suited their opinion (1= totally disagree, 4= totally agree).

Table 2. Mean values on a scale of 1-4 of students' (N= 10) replies to eight statements about the experience of concept mapping.

	Mean
It was helpful for me to use concept mapping to study National Romantic style.	2.70
It was fun to use concept mapping software.	2.50
It was useful to study with the help of concept mapping software.	2.60
It was easy to construct concept maps.	3.60
Concept mapping helped me to understand the subject in its entirety.	2.90
It was easy to build superordinate term - proposition- subordinate term paths.	2.90
We had adequate time to become familiar with the software.	3.50
Visualizing ideas and concept relations was helpful for me.	2.67
Overall mean	**2.92**

Overall, the students felt that the use of concept mapping software was easy and that it did not require much time to get acquainted with it. They found the process of concept mapping itself to be easy to adopt and perceived it to be useful in their learning. Of the respondents, 60% said that they would benefit from using concept mapping in other disciples and 40 % stated that they would rather use concept mapping technique when taking notes in lessons instead of writing notes with pen and paper.

Students were also asked to broadly describe their experiences and ideas about concept mapping. The attitude was positive overall, with most comments stating concept maps helped memorization and improved learning.

> *Student 11: "I think I would learn even better if I was to do the map with pen and paper, but either way I would memorize more about the subject than by just reading."*
>
> *Student 09: "Various topics were more easily memorized than with writing notes on my worksheet".*

None of the respondents stated that concept mapping would have been an undesirable way to learn. The few negative comments were about having to deal with a difficult or uninteresting topic, or that working with a computer was tiring. It is interesting to notice that even in the positive comments above the students are writing about memorization, not about learning or understanding. Is school a place for learning or a place to memorize things for tests to come? The answer might be different, depending on whether you asked a student or teacher.

7 Conclusions

The small group of students who took part in this study found it easy, favorable, and useful to use concept mapping techniques and software as a means of learning. This is consistent with other studies. Asan (2007) found 5th grade students perceived concept mapping in a positive manner with regard to both the software and helping them understand the material. Of Oliver's (2007) 6th grade student respondents, 65% loved or liked using concept mapping and were even more positive about it in conjunction with readings. The results of this study showed moderate correlation between having better reading skills and performing better in constructing concept maps more accurately. Oliver did not find reading skills to be related to a student's ability to construct average rated maps.

The study presented in this paper was designed to provide data about introducing concept mapping technology and software to students. The results were encouraging and further support the idea that concept mapping, with the aid of computer software, could be one of the first "killer applications" that can unite computer technology seamlessly into the learning process, bring pedagogically grounded Information and Communication Technologies (ICT) into classrooms, and promote learning through conceptual changes, as learning in the Finnish National Core Curriculum today is regarded to happen in an active process, where students process and interpret the material to be learned on the basis of existing structure of knowledge. With concept mapping, students are able to view, refine, edit and share their knowledge 'horizon' in a way that has not been possible before. Future research will target one basic education school with a large sample group of students and teachers as a framework, and concentrate on collaborative knowledge building with concept maps. The effect of learning with concept mapping will also be studied with control groups and pre-post testing

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Virtual and Simulation-Based Learning

Virtuality versus Reality Based Learning Experiences: Is There an Education Effect on Student Preferences?

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This exploratory study addresses differences between virtuality and reality based learning experiences. Pine and Gilmore (1999) proposed that experiences consist of educational, entertainment, esthetic and escapist realms. Previous research found that these four realms contribute variably to consumer perceptions of bed and breakfast experiences (Oh et a. 2007) and retail website patronage intentions (Jeong et al., 2009). This study extends prior research by investigating how the four realms influence student perceptions and preferences of virtuality and reality based learning experiences. The study exposed a small sample of students to virtual learning through hotel website evaluations, and to reality based learning through site visits to the same hotels. Student perceptions were measured based on an eight item Likert scale with two items per experience realm. A linear regression model showed that the real life entertainment, escapism and esthetic realms, and the virtual entertainment realm had significant effect on student brand preferences. However, the real life and virtual educational realms had non-significant effects. At the individual hotel brand level, real life experience realms produced stronger student perceptions than virtual realms in general. The exception was the least preferred brand which had stronger virtual educational, entertainment and esthetic perceptions than the respective real life realms. This exploratory study suggests that in order to create memorable learning experiences, educators should blend virtuality and reality based learning tools across the four realms. The study concludes with implications for future research and with limitations of the study including small sample size and possible confounding variables.

Keywords: virtual learning, reality based learning, memorable experiences

1 Introduction

New technologies such as internet, websites, photo and video sharing, blogs, podcasts, wikis, mash-ups, online discussion forums and social media provide new learning tools that can enhance traditional class room learning by offering virtual learning experiences that can both substitute and support real life based learning such as field visits. The goal of virtual and real life teaching is to provide memorable learning experiences that students can retain and recall long after the event. This study investigates the differences between virtuality and reality based memorable learning experiences. Pine and Gilmore (1999) proposed that memorable experiences consist of educational, entertainment, esthetic and escapist realms. Previous research has found that these four realms contribute variably to consumer perceptions of bed and breakfast experiences (Oh et al., 2007) and retail website patronage intentions (Jeong et al. 2009). An important finding was that the educational realm was not a major factor in creating memorable experiences. This paper first reviews relevant literature regarding learning and teaching models, memorable experiences and virtual learning tools, and their implications for the study. The paper then explains the study, reports the results and concludes with limitations and implications for educators and future studies.

2 Aims and objectives

It is important for educators to know what type of virtual and real life learning tools create memorable experiences based on the four realms of experience proposed by Pine and Gilmore (1999). The objective of this study is to extend previous research by investigating how the four realms in the context of virtuality and reality based learning experiences influence student preferences of hotel brands. The current generation Y college students are comfortable with new virtual learning tools such as internet, websites, photo and video sharing, blogs, podcasts, wikis, mash-ups, online discussion forums and social media. The critical question is whether these virtual tools yield stronger *educational*, *entertainment*, *escapism* and *esthetic* learning experiences than real life learning tools such as lectures and field visits. This study addresses this critical question first by exposing students to virtual learning through hotel websites evaluations, and then to reality based learning through site visits to the same hotels that they had evaluated on the websites. The student perceptions of the

learning experiences are measured based on an eight item Likert scale with two items for each of the four experience realms.

3 Background

There are three streams of research that are relevant for this study. First, research regarding student learning and teaching is necessary for understanding how students learn and how learning can be enhanced by creating memorable learning experiences. The second area of research addresses consumer perceptions of memorable experiences which have been shown to be influenced by educational, entertainment, esthetic and escapist realms of the experience. The third area of research addresses virtual learning experiences with focus on web-based learning tools. These three streams of research are reviewed in terms of their implications for this study.

3.1 Student Learning and Teaching Model

Biggs (1978) and Prosser et al. (1994) have proposed the *Presage-Process-Product model* of learning and teaching. The *Presage* stage addresses student characteristics (e.g. previous experiences, current understanding), as well as course and departmental learning context (e.g. course design, teaching methods, assessment). The *Process* stage takes into consideration students' perceptions of context (e.g. good teaching, clear goals) and approaches to learning (how they learn e.g. surface versus deep). The *Product* stage focuses on students' learning outcomes (what they learn in terms of quantity and quality). This model suggests that students' perceptions of the learning and teaching context are an interaction between their previous experiences of learning and teaching, and the learning and teaching context itself. Students approach their studies in relation to their perceptions of the context, and that approach is related to the quality of their learning outcome.

This study applies the *Presage-Process-Product model* that has been found to be applicable for learning and teaching in applied fields such as MBA programs (Laitamaki and Laitamaki 2009). This study was conducted as a part of the Brand Management course which provided relevant learning context in terms of the course design, teaching methods, and assessment which were aligned with the objectives of the study. Regarding the *presage stage* of previous experiences and current understanding, the data collection was implemented on the 13th week of the 15 week semester so that students had knowledge of key branding concepts through lecturers, hotel website evaluations and field visits. The *process stage* considered students' perceptions of the brand management learning context where a study of hotel brands was relevant to the subject matter and learning goals of the course. The learning approach was considered by offering both virtual and real life based learning opportunities. The *product stage* considered students' learning outcomes by comparing their perceptions of virtuality versus reality based learning experiences. In summary, the study was designed to reflect natural learning experience where students could approach their studies in relation to their perceptions of the hotel brand management context. This was done by putting the focus on the individual students and their memorable learning experience as proposed by Biggs (1974) and Prosser et al. (1994).

3.2 Memorable Experiences

Ritchie and Hudson (2009) did an extensive review of consumer and tourist experience literature and identified following six streams of research: the essence of the experience; consumer choice and behaviour; methodologies for experience research; understanding specific kinds of tourism experience; research related to managerial concerns; and evolutionary focus of experience research. This study addresses methodologies for experience research in the context of memorable learning experiences. Pine and Gilmore (1999) propose that organizations have moved from delivering services to staging memorable experiences. They suggest that organizations can stage memorable experiences based on the four realms of experience. They should find the right combination or the sweet spot of the educational, entertainment, escapist, and esthetic realms so that they can differentiate their offerings and engage individuals in a very personal way. These four dimensions can be described on two axes of active versus passive customer participation, and absorption versus immersion describing the connection that the customer has with the experience.

Educational realm provides active customer participation with absorption type connection to the experience. By visiting the hotel website or the hotel itself a person can actively learn about the hotel by seeking and absorbing relevant information such as room rates and room layouts. Oh et al. (2007) found that educational experiences were significantly related to arousal but not to memory, overall quality and satisfaction with bed and breakfast

experiences. Jeong et al. (2009) found that the educational realm had non-significant effect on retail website patronage intention, pleasure and arousal.

Entertainment realm provides passive customer participation with absorption type connection to the experience. Pine and Gilmore (1999) propose that entertainment experiences, which involve observation of performances, lead to positive consumer responses. The website evaluation and the hotel visit can have entertainment aspects where a person passively absorbs the information by watching video tours or listening the hotel tour guide. Liu and Arnett (2000) suggested that playfulness (or entertainment) during online shopping leads to website success due to increased pleasure. Oh et al. (2007) found that entertainment experiences were not significantly related to arousal, memory, overall quality and satisfaction with bed and breakfast experiences. Jeong et al. (2009) found that the entertainment realm had significant effect on retail website patronage intention, pleasure and arousal.

Esthetic realm immerses customers in a passive participation of the experience. A person can view different rooms either by taking a virtual tour on the website or by visiting several room types which allow the person passively immerse to the experience. Oh et al. (2007) found that esthetic experiences in tourism were significantly related to arousal, memory, overall quality and satisfaction with bed and breakfast experiences. Jeong et al. (2009) found that the esthetic realm had a significant effect on retail website patronage intention, pleasure and arousal.

Escapist realm immerses a person through active participation in the experience. A hotel can provide an escapist experience by giving an option for a person to design the hotel experience. This can be done by choosing amenities and services during a virtual tour of the website, or during a visit to the hotel. Fiore and Ogle (2000) suggested that through products and retail environments a consumer may take on an "*alternative existence*," where he/she takes on a desired identity and fantasizes about pleasant scenarios involving this identity. Oh et al. (2007) found that escapism experiences were not significantly related to arousal, memory, overall quality and satisfaction with bed and breakfast experiences. Jeong et al. (2009) found that the escapism realm had non-significant effect on retail website patronage intention and arousal but a significant effect on pleasure.

In summary, the previous research suggests that guest arousal, satisfaction, memories and perceptions of bed and breakfast quality are mainly influenced by the esthetic realm and to some extent by the educational realm. The retail website patronage intention is mainly influenced by the esthetic and escapist realms but not by educational and entertainment realms. Pine and Gilmore (1999) propose that a well-staged experience leads to an enhanced memory and positive attitude toward the event. Appealing to consumer's five senses is likely to result in additive effects on memories because sensory-based emotional information has better access to cognitive processing resources leading to stronger memory formation (Pine and Gilmore, 1999).

3.3 Virtual Learning Experiences and Hotel Website Evaluations

The technological democratization of the tools of production, distribution, content and supply has also entered the field of higher education (Anderson, 2006). As a result of new technologies Li and Bernoff (2008) have identified the new shifting pattern of behaviour they call "*groundswell which is a social trend in which people use technologies to get things they need from each other, rather than from traditional institutions like corporations.*" Higher education is one of the traditional institutions that need to change and adapt to this new shift in *groundswell* driven student behaviour. Salmon (2005) has identified the following five conceptual underpinnings that define this change in higher education: *introduction of learning technologies; different modes of learning; institutional change; pedagogy and research*. This study focuses on the first two concepts of learning technologies and different modes of learning.

Greenhow et al. (2009) suggest that Web 2.0 media are applicable for enhancing generation and sharing of knowledge in educational research communities. They categorized Web 2.0 technologies into *interconnections, content creation and mixing* and *interactivity*. Dede (2009) studied ten forms of emerging educational Web 2.0 technologies in terms of their potential to enhance learning by promoting creativity, collaboration, and sharing. He categorized them into following three groups: *sharing technologies* (communal bookmarking, photo and video sharing, social networking, and writer's workshops and fan fiction); *thinking technologies* (blogs, podcasts and online discussion forums); and *co-creating* (wikis and collaborative file creation, mash-ups and collective media creation, and collaborative social change communities).

This study focuses on web-based learning of virtual hotel website evaluations, and compares it with reality based learning of hotel field visits. Gosper et al. (2008) investigated web-based learning technologies (WBLT) in Australia and identified a digital divide between lecturers and their students and concluded that WBLT will change the way students learn, teachers teach, and how the curriculum is designed. Blight (2000) has reflected the need for the change by stating that *"lectures are not as effective as discussion for thought and are relatively ineffective for inspiring interest in the subject."* Given the critique towards traditional lectures, this study uses hotel field visits as the reality based learning experiences and compares them with virtuality based hotel website evaluations.

Modern technologies such as websites allow hotels to stage their services in the virtual world by providing web-based experiences. Schmidt (2008) classified hotel website evaluations according to evaluation by phases, evaluation by characteristics, and evaluation by characteristics and effectiveness. Ip et al. (2010) reviewed 68 website evaluation studies in tourism and hospitality industries. They concluded that most of the studies were based on evaluation by content (29) and a combination of content and design (13). Rong et al., (2009) found out that online purchasers and browsers had different perceptions of hotel websites, and that reservation information, facilities information and contact information are considered to be the most important factors in website quality. The focus of this study was on browsers even though student purchase preferences were also measured. This study contributes to the website evaluation literature by extending it to the consumer perception of the website content and design based on the four experience realms proposed by Pine and Gilmore (1999).

4 Methods

Due to the exploratory nature of this study it was based on a convenience sample of 13 undergraduate students enrolled in a Brand Management course at New York University in Manhattan. The average age was 22 and there were ten female and three male students. This course was chosen because hotel website evaluations and field visits were natural learning components of the course. Students were asked to evaluate websites for specific four hotels prior to field visits to the same hotels. After website evaluations and field visits students answered a survey eliciting their perceptions of the four experience realms and preferences in terms of their intention to recommend the hotel and to stay at the hotel. The scale items were adapted from the research by Oh et al. (2007) and Jeong et al. (2009) who had found them applicable in the context of bed and breakfast experiences and retail online shopping respectively. The scale included two items per educational, entertainment, escapist and esthetic experience realms. Students were informed that the survey was measuring their preferences towards the four hotel brands in the context of the websites and the field visits. Table 1 illustrates the items used for measuring the four experience realms and student preferences.

Table 1: The Hotel Website and Hotel Tour Evaluation Items

Entertainment realm: The website
- The website was very entertaining
- I really enjoyed looking at the website

Entertainment realm: The hotel tour
- The hotel was very entertaining
- I really enjoyed the hotel

Education realm: The website
- The website stimulated my curiosity to learn about the hotel
- The website made me more knowledgeable about the hotel

Education realm: The hotel tour
- The hotel stimulated my curiosity to learn about it
- The hotel tour made me more knowledgeable about the hotel

Escapist realm: The website
- When looking at the website I felt I was actually in the hotel
- While looking at the website, I completely escaped from reality

Escapist realm: The hotel tour
- The hotel tour made me feel I was actually staying in the hotel
- During the hotel tour, I completely escaped from reality

Esthetic realm: The website
- The website was very attractive
- The website really showed attention to detail

Esthetic realm: The hotel tour
- The hotel was very attractive
- The hotel really showed attention to detail

Student preferences: The website and the hotel tour
- I will recommend this hotel
- I will stay at this hotel

Scale: Strongly Disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly Agree (5)

5 Results

The average rating for the virtual and real life learning experiences was 3.412 (based on the scale of 1 to 5 see Table 2) with standard deviation of 1.117. The sample data did not represent normal distribution because the cumulative distribution function was 0.356 and the probability mass function was 0.333. The distribution of data was relatively flat with negative kurtosis value of -0.82, and it was slightly skewed towards lower values with a skewness score of -0.208. Table 2 illustrates student preferences towards the four hotel brands (on a scale 1 lowest and 5 highest preference). Brand D was the most preferred brand based on real life learning experiences (i.e. hotel field visits) and it received highest recommendation score of 4.54, and intention to stay score of 4.46. Brand C was the second most preferred brand based on virtual learning experiences with a recommendation score of 3.85 and intention to stay score of 3.69. Brand B was the least preferred brand based on real life learning experiences, and Brand A based on virtual learning experiences with a similar score of 2.77. At the hotel brand level, real life learning experiences produced stronger student perceptions than virtual website evaluations in 13 out of 16 comparisons. The exception was the least preferred Brand B whose virtual entertainment, virtual education and virtual esthetic scores were higher than the respective real life scores. These results suggest that the virtual world of hotel websites can compensate some of the limitations in real life experiences, especially when the hotel is not highly preferred. However, none of the differences between virtual and real life based experience realms were statistically significant.

Table 2: Hotel Brand Preferences

N=13	Will recommend the hotel		Will stay at the hotel	
	Reality	Virtuality	Reality	Virtuality
Brand A	3.46	2.77	3.31	2.77
Brand B	2.77	3.00	2.77	3.08
Brand C	4.46	3.85	4.38	3.69
Brand D	4.54	3.62	4.46	3.38

Scale: Strongly Disagree (1); Disagree (2); Neutral (3); Agree (4); Strongly Agree (5)

The effect of the student perceptions of the four real life and the four virtual experience realms on brand preference was measured based on a linear regression model that used aggregated data across the four brands. This aggregated approach resulted in a model where N was 52 because each of the 13 students indicated their preferences for each of the four brands (i.e. 13x4=52). The non-normal distribution of the data and the small sample size did not meet the assumptions of parametric statistics which is why the data was analyzed based on non-parametric linear regression. The dependent variable of brand preference was based on the average score between willingness to recommend the hotel and willingness to stay at the hotel. The correlations between brand preference and the four real life experience realms were strongest for the education (0.82) and entertainment (0.81) realms followed by the esthetic (0.79) and escapist (0.64) realms. The results for the non-parametric linear regression in Table 3 show that the real life entertainment, escapism and esthetic realms had a significant effect on brand preference at the level of $p<0.05$. The real life educational realm did not have a significant effect. The linear regression model of the four real life learning experiences explained 74 percent of the variance in student preferences.

Table 3: Reality Based Learning Experience Realms Effect on Brand Preference

N=52	Entertainment	Education	Escapism	Esthetic	Constant
Coefficient	0.238705**	0.02251	0.412491**	0.277673**	0.133045
St. error of coefficient	0.141894	0.108997	0.190567	0.14353	0.359006
R-square	0.738445	St. error of Y	0.554472		
F-value	33.17362	Degrees of freedom	47		
Sum of squares	40.79553	Resid. sum of squares	14.44966	**) p< 0.05	
t-value	1.682277	0.206519	2.164546	1.934599	0.370593

The correlations between brand preference and the four virtual experience realms were not as strong as those of the real life experience realms. The strongest correlation was for the entertainment (0.55) and esthetic (0.51) realms followed by the escapist (0.48) and esthetic (0.43) realms. The results for the non-parametric linear regression in Table 4 show that the entertainment realm had a significant effect on brand preference at level of $p<0.1$. The other three virtual realms did not have significant effect on brand preference. This non-parametric linear regression model of virtual learning experiences explained only 33 percent of the variance in student preferences.

Table 4: Virtuality Based Learning Experience Realms Effect on Brand Preference

N=52	Entertainment	Education	Escapism	Esthetic	Constant
Coefficient	0.177763*	0.113931	-0.03888	0.238591	1.742143
St. error of coefficient	0.152763	0.138592	0.164663	0.188109	0.383946
R-square	0.33411	St. error of Y	0.660047		
F-value	5.895564	Degrees of freedom	47		
Sum of squares	10.27389	Resid. sum of squares	20.47611	*) p< 0.1	
t-value	1.163652	0.82206	-0.23612	1.268366	0.371316

5.1 Implications

These study results suggest that the real life based entertainment, esthetic and escapist learning experiences influence student preferences of hotel brands. However, the educational experiences have non-significant effect. The real life learning experiences provided stronger perceptions than the virtual ones. However, the differences were small (0.38 to 0.73 on a scale 1 to 5) and non-significant. Also the least preferred brand produced opposite results where virtual educational, entertainment and escapist realms showed stronger student perceptions than the respective real life realms. These results suggest a blended learning model where real life learning experiences can be complemented with virtual learning tools such as web based learning. Virtual learning experiences might also be more economical and offer more flexibility because they are not dependent on time and place similar to real life learning experiences such as field visits and traditional class room lecturers.

5.2 Possible Applications

This study can be applied to hospitality and tourism courses where virtual and real life learning experiences are a natural way for students to learn. The study however has several limitations that need to be considered. First, the convenience sample of 13 students was small and limited to college seniors. It does not represent the total population of seniors. Future studies should rely on random samples that represent better the populations under investigation. Second, the eight item Likert scale was limited to two items per experience realm. Future studies should complement and expand the scale with more items per each realm. Third, the website evaluations took place in a non-controlled environment which may influence the reliability of data due to possible confounding variables related to students' prior knowledge and preferences of the brands and other situational factors. Future studies should address this issue with more controlled website evaluations in laboratory settings. Fourth, the chosen course content and product category may affect the results, and future studies should apply the study to other course contexts. Finally, the study was conducted in Manhattan New York City which is one of the most cross-cultural cities and hotel markets in the world. This diversity may have influenced the results and future studies could be conducted in culturally more homogenous cities.

6 Conclusions

This study expanded the applicability of the four experience realms to virtuality and reality based student learning. The results suggest that real life learning based entertainment, escapism and esthetic realms influence student preferences of hotel brands. An important finding was that neither the reality nor the virtuality based education realm had significant effect on student hotel brand preferences. These results suggest that educators should design learning exercises with strong educational experiences that students will remember and can learn from. Students may prefer entertainment, escapism and esthetic experiences over education, however it is the responsibility of the educator to make sure that they will also learn.

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LabLife3D: Teaching Biotechnology and Chemistry to Engineering Students by Using Second Life

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Practical skills are one of the core competencies in natural sciences, where skills and experience are gained through extensive laboratory experimentation. However, current laboratory courses at Aalto University are burdened by heavy expenses for modern and safe equipment, facilities and reagents. Students suffer from large class sizes and overlapping schedules with other courses. Although learning by doing is the ultimate goal of practical laboratory classes, it is evident that the current curriculum lacks the space and time for the learning experience to mature. Consequently, many students pass laboratory classes without developing a critical thought process of connecting theory with practice. LabLife3D helps to bridge the gap between theory and practice by supporting contact teaching with simulations and virtual experimentation using the Second Life platform.

LabLife3D engages students to experiment and critically evaluate the inherent behavior of biological or chemical material in a shared local space. It facilitates engagement by offering experimentation in a risk-free environment. Also the non-biotech/chemistry major students across Aalto University can participate in experimentation and contribute to their multidisciplinary knowledge of experimental work. This allows them to better understand the experimental work as a major activity of many commercial and design ventures engaged in life sciences.

The virtual laboratory LabLife3D has one section dedicated to cleanroom facilities and the other to chemistry. The students can discuss and reflect their work in the lobby. LabLife3D is housed in the Aalto Archipelago in Second Life virtual world and is freely accessible for visitors.

Keywords: Second Life, virtual laboratory, biotechnology, chemistry

1 Introduction

Engaged learning is commitment to a significant, in-depth, lifelong learning process, which extends beyond the classroom. Engaged learning is an integral part of all learning tools, verbal, digital, visual or emotional, which are used to increase personal and group commitment, regardless of prior success or talent thereof. Students learn in an environment that favours activity and experience and fosters immediate engagement. (Ramsden, 1988) Accordingly, “Learning should be seen as a qualitative change in a person’s view of seeing, experiencing and understanding, conceptualizing something in the real world rather than a quantitative change in the amount of knowledge someone possesses” (Biggs, 1999). Goal setting, active participation taking responsibility and feedback should be shared by students and teacher alike. Significant learning (Fink, 2003) can only be built on mutual commitment and respect between leaner and teacher.

Technology is a significant part in the learning of the millennial student (Gilbert, 2007). Incorporating virtual technologies enables the learning space to engage student and teacher in mutually enriching, active and learning centered interactions. Virtual technologies also help in adjusting the teacher-to-student ratio. Such technologies can be used to facilitate interaction and discussion in cyberspace. This practice should be seen where possible as an alternative, rather than as a replacement to face-to-face communication. (Daniel, 2008) Virtual worlds are usually a part of a larger learning environment, which is more than just a classroom. As stated by Wilson "A learning environment is a place or community where people can draw upon resources to make sense out of things and construct meaningful solutions to problems" (Wilson, 1996).

It is suggested in literature, that virtual worlds in education lead to increased engagement (Palomäki, 2009). Brain activity has been measured for tasks performed in real as well as in virtual reality environments (Mikropoulos, 2001). His findings demonstrated subject being more attentive, responsive, and utilized less mental effort in the virtual world, showing that knowledge transfer of information gained in one world to the other world is possible. Moreover, students are more engaged in learning tasks and spend more time thinking and discussing the subject material (Mason, 2007). Immersion into another world has also been noted and engaging in learning in the first person, being more interactive and experiential (Richter, Anderson-Inman, & Frisbee, 2007). As learners are allowed to interact with information in the first person, this facilitates constructivist-based learning activities (Dickey, 2005). Furthermore, the interaction with virtual objects can be helpful in developing a stronger conceptual understanding, depending on the content. When using virtual worlds, engagement experiences are present and the enthusiasm for learning can increase (Foster, 2007a). It has also been documented that the 3D virtual worlds facilitate the visualization of difficult content and offer tools for learning challenging concepts (Barab et al., 2000). Moreover, the benefits of Second Life include providing “a social laboratory where role-playing, simulations, exploration, and experimentation can be tried out in a relatively risk-free environment” (Graves, 2008). From these reasons the Second Life virtual world was selected to be the platform for LabLife3D.

1.1 LabLife3D environment

LabLife3D is a simulated laboratory environment build inside the Second Life virtual world. During the planning and implementation process subject experts were consulted to realistically model a physical laboratory to the virtual world. Photographs from laboratory equipment were used to build realistic models inside LabLife3D. The laboratory building includes an organic chemistry laboratory, clean room facilities, and a lobby to be used as a discussion place for students. Students can walk inside the laboratory premises, and get to know laboratory equipment and procedures. They can chat via text, or have conversations in a Skype-like manner using a headset. They can perform step-by-step pre-coded laboratory experiments. Two such experiments are currently built into the system. Figure 1 shows a general view inside the simulated laboratory.

Figure 1. LabLife3D premises and a view to the organic laboratory.

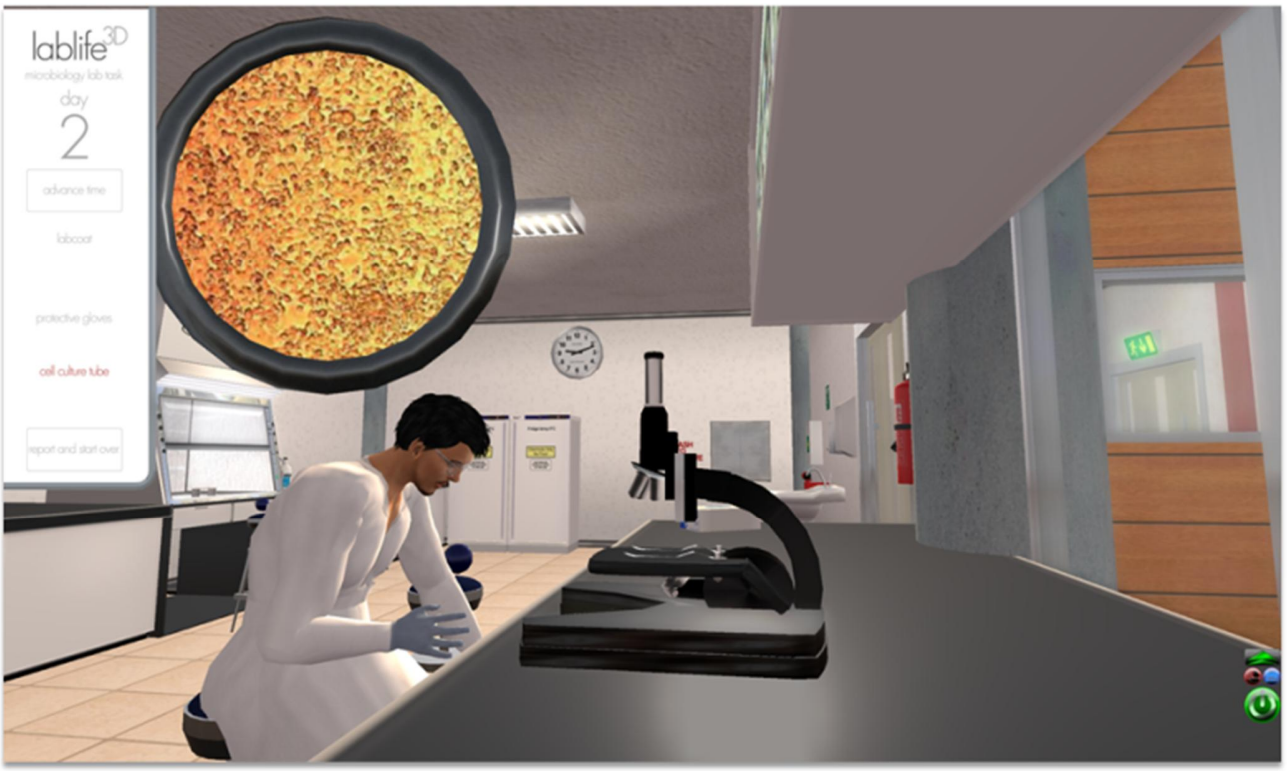

Figure 2. A snapshot from a virus identification scenario conducted inside the clean room zone. The student is using a microscope to examine a sample after a growth period of two days. The round image in the upper left quarter shows the image from the microscope.

2 Aims and objectives

The approach used in course planning was to promote constructive alignment learning and principles for good teaching (Biggs, 1999; Ramsden, 1992) (Figure 3). Such practices must draw on empirical evidence that integrates sound pedagogy with identified learner traits and learning styles. Learning styles reflect the different approaches to learning that individual students have. These individual approaches were accounted and integrated into the instructional design, teaching practices, feedback, and assessment.

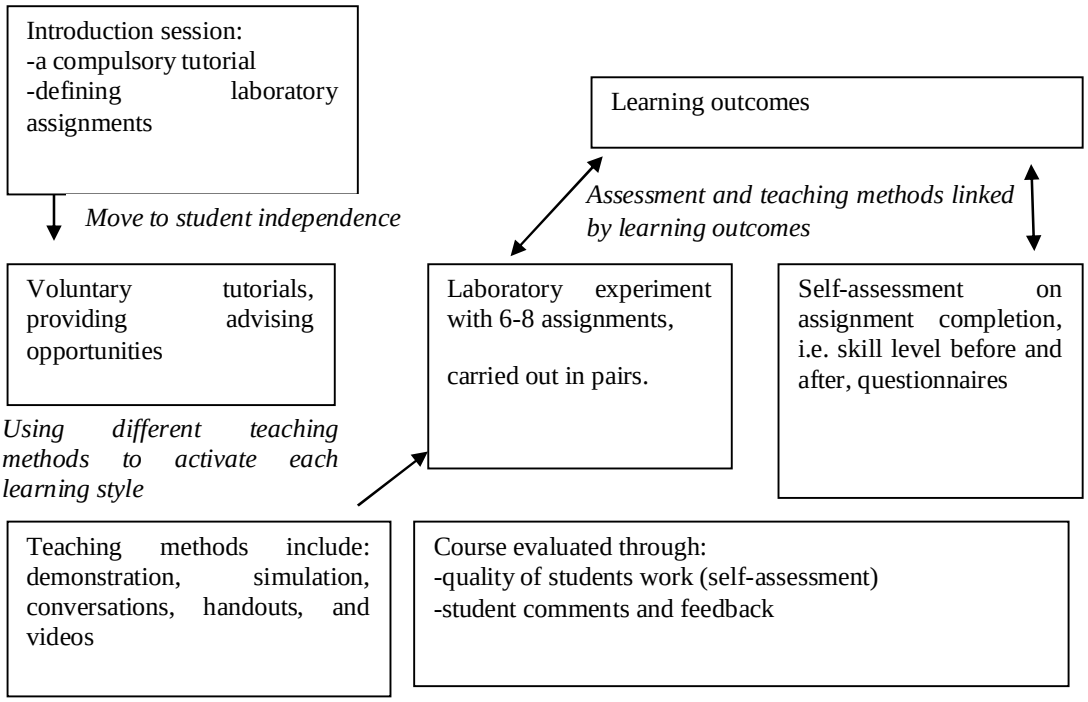

Figure 3. Course design as adapted to learning frameworks.

The project began with definition of 1) Team administrative details and 2) Content and learning related details. Administrative details comprised the definition of the roles of the project team and signing of agreements for IPR between the team and the university. Content and learning related details were implemented by initial visits to other Second Life learning platforms, planning and building of the laboratories for microbiology and chemistry, and designing the "laboratory classes" to be implemented in the Second Life environment.

2.1 Project team roles

The planning team consisted of nine individuals for whom specific roles were assigned according to the previously developed role outline (Palomäki, 2009), (Table 1).

Table 1. Roles, expertise and responsibilities of the team. Based on (Palomäki, 2009). (* and ** = the same individual with two roles)

Role	Background	Responsibility
Project coordinator	Professor* (Microbiology)	Contract negotiations, copyright issues, guiding meetings, team communication, schedules, budgeting, and project monitoring.
Content experts, Instructors	3 Ph.D. students** (Microbiology) 1 Postdoc (Organic chemistry) 1 Professor (Organic chemistry) 1 Professor* (Microbiology)	Content expert: Providing opinion, experience, and expertise about the topic of the course. Content scriptwriting, i.e., producing learning material, exercises, the syllabus, teaching solutions, and planning the study processes Instructors: Based on experiences, the person in the role of the content expert is the best choice for the course instructor, i.e., the teacher. They have the responsilibity of instruction and guiding students inside the virtual world. Earlier experience about virtual worlds is not necessary needed.
Web didactic expert	2 Pedagogical experts (Education development)	Planning the educational activities in Internet and virtual world. Expertise in university pedagogy, tools and learning processes.
Web didactic expert and www-producer	1 Ph.D. student (Work psychology) Virtual worlds and as learning environments 1 Student	Works in the role of production scriptwriter. Building the virtual world solutions with the developer according to the production script. Planning of visual layout and final implementation solution for the tools and environment. Structure and functional requirements of the course. Updates and changes to the learning environment during the course.
Developer and graphic designer	Outside expert	Developer plans and implements the needed solutions according to the production script. Previous expertise of creating virtual learning environments is needed. Makes updates and changes to the learning environment during the course.
IT support	University	Providing IT support and access.
Secretary	1 Ph.D. student** Microbiology	Manages team planning schedules, meetings and announces course news and collaborates with university planning officer.

2.2 Implementation of LabLife3D

At the start of the project the university had limited impact on the building process of the LabLife3D as it had no existing practices present for using Second Life. However, the university owned an archipelago, i.e. an area inside the virtual world, which the LabLife3D project decided to use. At the beginning of the planning phase, virtual worlds and their use in education were introduced to the project team. The project team had little or no previous experience of virtual worlds and it was therefore important to first increase their understanding of virtual worlds. Members of the team were then able to present ideas of possible scenarios which may be reasonable to implement in the Second Life environment and plan on how to best utilize the advantages of

virtual worlds. After the introduction, the project team started planning the teaching scenarios. From here, rapid prototyping model was used. That is, the scenario and the virtual laboratory were developed in small cycles, so that the construction and the scenario planning created ideas and feedback for each other. At the same time lists with images of the equipment needed were created. An experienced Second Life developer was used in implementing the virtual world solutions. Using both the expertise of the content experts, the virtual world didactic expert and the developer, the scenarios were shaped to suite the virtual world and educational goals.

Before entering LabLife3D students and were designated into pairs, where an attempt was made to try to pair individuals with familiarity with virtual worlds (e.g. games) with those students with less experience. Prior to entering the LabLife3D laboratory customized their avatars in a mandatory introduction session (Figure 3). This session familiarized the students with technical details and the assignments to be done in the Second Life laboratory. In the initial phase of this project 10 students took part in the microbiology experiments and 10 students in the chemistry safety laboratory. The aim is to increase the number of students as the concept is sufficiently tested.

When entering the laboratory building the users were given an object that worked as a head-up-display (HUD) as a box on their screen. On the HUD there are buttons that can be used to control the scenarios and information about the scenario status and student actions are shown. The HUD transforms the Second Life experience into a game-like laboratory simulation, where the actions of the students are tracked. There are plans to integrate PIVOTE software (http://www.pivote.info/) to track the student actions and report them to the teacher after the session.

Two microbiology cases were designed for biotechnology majors, namely working with viruses and isolation of bacteria from process industry waters. The laboratories were designed in accordance with the learning goals, i.e. the microbiology laboratory was based on the learning of aseptic technique, which is essential for minimizing contamination and, on the other hand protecting the laboratory staff from infections. In the virus isolation and identification assignment each student uses their avatar to navigate through the laboratory. Students are required to perform a certain task, e.g. adding virus to a mixture of growth media and placing this into a centrifuge. The students are guided through tasks such as gowning for sterile chambers, washing and disinfecting hands, using a microscope, placing virus cultures into an incubator etc. Similar tasks are also performed for the second case with the aim of identification of contaminants from process industry waters. In order to extend this virtual laboratory – scale experience into reality, students are required to calculate the amount of disinfectant that would be needed for elimination of the contaminant by scaling their findings to the process scale in industry (Figure 3). Some tasks require specific hand movements or avatar navigation and are difficult to demonstrate properly in a virtual world. For those tasks, video clips are to be embedded in the laboratory displays. To promote learning and give students real-time feedback, students also receive a list of points to remember whilst working in the laboratory environment, and a questionnaire is filled in at the beginning and the end of the virtual laboratory session.

The focus of the chemistry laboratory is on safety in the chemistry laboratory, which chemistry major students complete before the real-life practical class. This allows students to familiarize themselves with the practical laboratory and to become aware of potential hazards and prevention of such hazards. The learning process was been divided in two separate cases. In the first case, students have open access to the laboratory where they can familiarize themselves with different equipment and laboratory hardware. The only safety requirement in this mode is the use of lab coats and goggles. Additional information is provided by links to teaching videos and other study material. In the second case, students are required to perform a simple organic reaction and the performance is evaluated with an end report. To pass the test students must take into account sufficient number of safety features; protective clothing, correct cleaning of chemical spills etc. Students are encouraged perform this task in addition to already existing mandatory online safety examination that is usually taken before the first real-life laboratory course.

3 Discussion

Student feedback suggested that the Second Life environment supports the development of communication and team work skills in addition to achieving the goals for motivation, independent work and learning-by-doing. Enhancing collaboration and communication is also in line with the desired learning outcomes for the

engineering students and extends also to the ability to interact with individuals located around the world (Barab et al., 2000). If time is given for students to customize their avatars to look like themselves, it can help to enhance on-line communication (Foster, 2007b).

Working with viruses, as facilitated in Second Life, provides the student with unique opportunity to familiarize with techniques related specifically with isolation and handling of viruses. Due to biological risk, high costs of virus laboratory designs, and restricted time in the curriculum, engineering students at our university do not have any other opportunity to familiarize themselves with viral methodology. The implementation of instruction on the safety in the chemistry laboratory has very practical justifications, as this knowledge is essential to all laboratory instrumentation in the life sciences and therefore includes a major student load. Evidently, students must also practice the actual laboratory skills in the real environment. Safety issues are of crucial importance to the safety of students and faculty as well as to the correct implementation of experimental work and consequently to the quality of scientific research data. In addition, at the end of the project we evaluated whether we had set the correct goals and where these goals relevant. This included feedback both from the students and their performance as well as self-assessment by the project team.

4 Conclusions

The first year pilot of the project met the objectives set. The emphasis of the first year was to investigate on how the teaching and learning activities in Second Life can support reaching the desired learning outcomes. The student feedback suggested advantages when compared to traditional teaching methods. This means the continuation of the project seems to be justified. Further topics for studies include the usage of the developed environment in other areas such as language training, and studying the change process related to the implementation of a new study and teaching method.

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First Year Nursing and Health Care Students' Learning Experiences of Training in Virtual and Simulation-based Learning Environment

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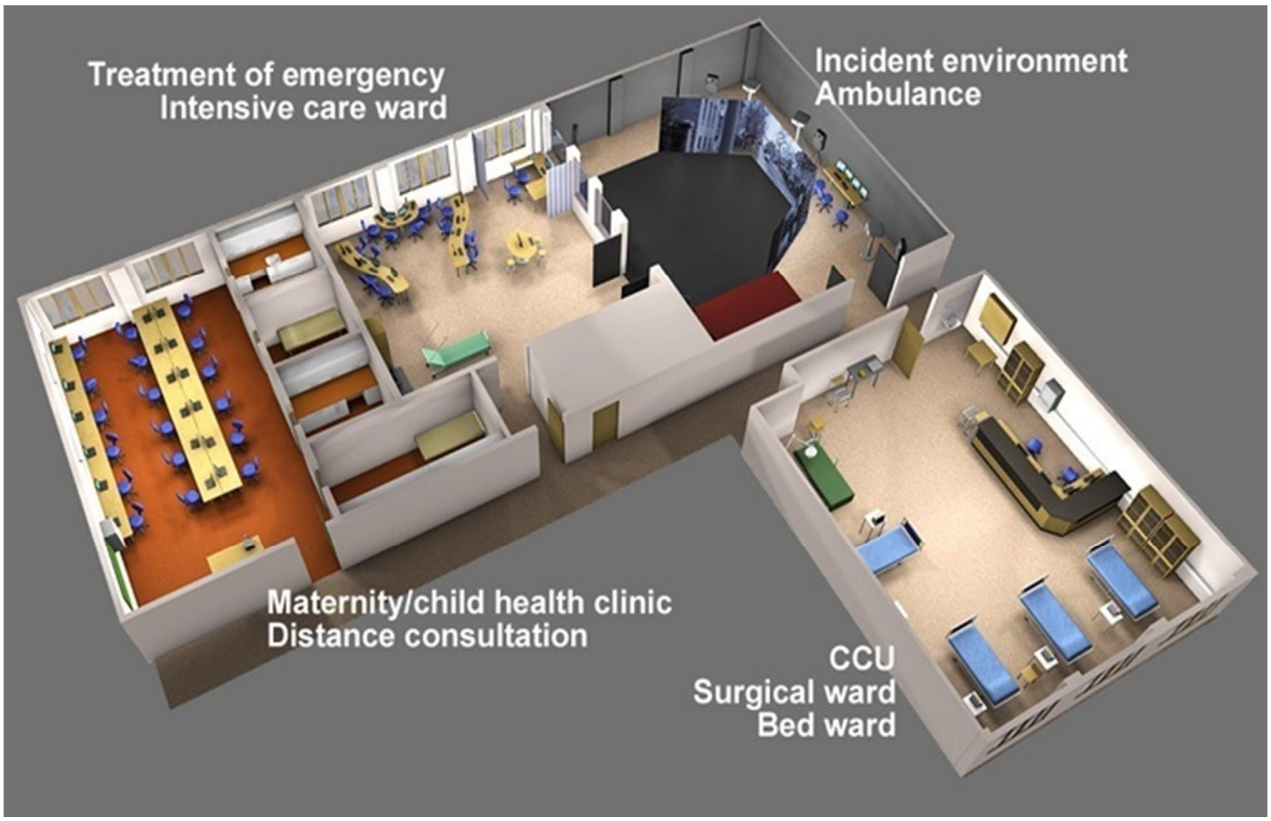
This research focused on the experiences of learners at the beginning of their programme of study. In the "ENVI" Virtual Center of Wellness Campus Rovaniemi University Applied Sciences in Finland, students can acquire knowledge, skills, and competence in clinical skills. This research presents the analysis of learning experiences of a group of nurses and public health nurses in ENVI, during their first year of studies. The theoretical perspective is rooted in sociocultural learning which describes learning as a function, and questions the experiences people get from learning situations. The research used a qualitative approach in analyzing the training experiences of the first year students first the whole group (n=55) and then half of the group (n=27). The research question in first year studies is: What kind of learning experiences did the nursing students have in the ENVI environment in their first year (2008–2009) studies? Data was collected from learning situations using post-questionnaire and interviews. Data was subjected to content analysis and then classified in to categories. In conclusion, the simulation-based and virtual environment is positively received. Also emotional experiences came up which should be taken into account. For the first year students, it is important, to have time to become familiar with the environment, and the options of repeating the simulation.

Keywords: Simulation-based learning, Virtual Environment, Nursing and Health Care Education, Learning experiences

1 Purpose of the Study

At the Rovaniemi University of Applied Sciences in Finland there is a Virtual Center of Wellness Campus the "ENVI". It is a virtual and simulation based learning environment where it is possible to simulate practical situations in health care and social care. It is divided into four classrooms (see figure 1). These are: 1.) incident environment and ambulance, 2) treatment of emergency and intensive care ward, 3) cardiac critical care (CCU), surgical ward and bed ward, and 4) maternity/child health clinic and distance consultation. The ENVI incident environment combines traditional simulation technology with an immersive visualisation environment, which is a virtual reality system where users can view, navigate and interact with hand-held interaction devices. This environment provides full-body movement in front of a large-scale display in a three-dimensional environment.



www.envi.fi
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Figure 1. ENVI Virtual Centre of Wellness Campus. Rovaniemi University of Applied Sciences© 2009.

There are reports about the benefits of simulation. When learning occurs in a risk-free environment, critical thinking is enhanced; this, in turn, improves students' technical and behavioural skills, gives them more self-confidence and teaches enhanced learners teamwork and communication skills (Kneebone, Kidd, Nestel, Asvall, Paraskeva & Darzi, 2002, 628–629; Sanci, Day, Coffey, Patton & Bowes, 2002, 44; Childress, Jeffries, Dixon, 2007, 131; Morgan, Cleave-Hogg, McIlroy & Devitt, 2002, 10–16). Furthermore, simulation uses well-accepted concepts of adult learning (Fanning & Gaba, 2007, 115–116).

The challenges in simulation relate to the teaching (activating and facilitating the scenario) and learning techniques; it is common to approach the simulated situations with some degree of disbelief and with difficulty responding honestly to the simulator (Childs, Sepples, Chambers, 2007, 35–40; Rettedal, 2009, 202–204).

This research presents the learning experiences of a group of 55 and then a group of 27 general nurses and public health nurses gained in the Virtual Center of Wellness Campus, ENVI, during their first year of studies. The students commenced their studies in September 2008 and visited the centre annually for further simulation training. This paper concentrates on presenting the results of the training experiences of the first year students (2008–2009). This work was guided by the following research question: What kind of learning experiences did the nursing students have in the ENVI environment in their first year studies? This study provides important information about novice students' learning in ENVI. Results of this study can be utilised by Rovaniemi University of Applied Sciences in further developing the studies in ENVI.

2 Theoretical Framework

The theoretical perspective is rooted in socio-cultural learning and questions what experiences people get from learning situations and what contents, interpretations and operational models people transfer to other contexts. (Säljö, 2001, 153; Wells, 1999, 304.) Learning occurs in interaction with the environment, developing all the time and moving the limits of practice and intellectual capability (Säljö, 2001, 27, 71) including the affective component of learning. (Kneebone, 2005, 551). Part of learning is a process of socialisation into the community of practitioners and participating in the socio-cultural practices of a community. This process is called "legitimate peripheral participation". (Lave & Wenger, 1991, 29–31; Wenger, 1998, 100–101.)

Socio-cultural learning includes Vygotsky´s (1978, 84–86) idea of "zone of proximal development". He defines this as "the distance between the actual developmental level 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" (Vygotsky, 1978, 86). Together Vygotskian and socio-cultural theory suggest that an environment should provide learning experiences where learners can widen their experience and participate effectively in the practices of larger society (Wells, 1999, 335).

The learning experiences can take a place within ecological system theory, which was created by Urie Bronfenbrenner (1979). In this, each system contains roles, norms and rules which may shape psychological development and reflect several environmental systems which are the microsystem, mesosystem, exosystem and macrosystem. (See Figure 2).

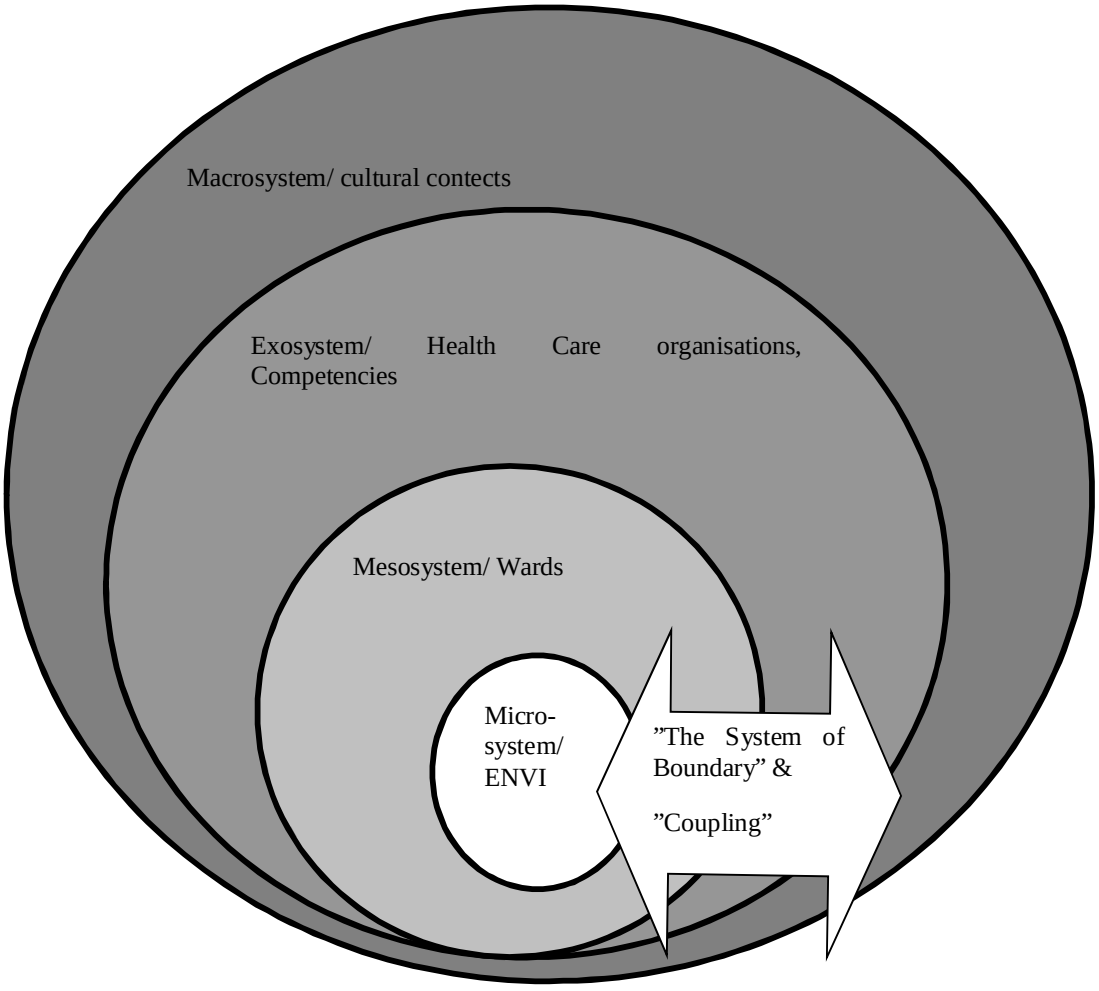

Figure 2. Zone of learning spaces in ENVI (cf. Bronfenbrenner, 1979).

All systems mutually affect each other. ENVI can be seen as "the system of boundary" or "the third room" where the students' world and the health care system intersect. In the best situation this means a reciprocity between learners with each other and with the learning space. (Seikkula, 1994a, 96–100; 1994b, 404–405.)

Simulation is used to create a scenario, which is an experience episode, designed around a specific problem or a task. The students train with a human patient simulator, which is a manikin, with features that cause it to react to treatments as an actual patient would. The human patient simulator is controlled by a computer, and it is set up in a room where different kinds of healthcare settings can be simulated (e.g. an accident at home) (Dieckmann, 2009a, 42; Hovancsek, 2007, 4). An effective simulation environment does not need to be identical to the clinical work environment, but it should provide learning experiences that enable students to meet their learning goals (Dieckmann, Manser, Rall & Wehner, 2009, 20).

3 Research Questions

The results are organised into concepts of learning experiences to answer the research question: What kind of learning experiences did the nursing students have in the ENVI environment in their first year studies?

1. What kind of learning experiences did students have in their first training period in ENVI?

2. What kind of learning experiences did students have in their second training period in ENVI?

4 Data Collection and Analysis Methods

This research used a qualitative approach to achieve the purpose of describing the nursing students' experiences. It employed a case study design which is a way to portray what it is like to be in a particular situation. Hence it is possible to have descriptions of participants´ lived experiences of, thoughts about, and feelings for a situation (Cohen, Manion, & Morrison, 2005, 181–182.) Field notes, observation and recordings were also selected as ways to explore the phenomenon. There were two phases of data collection.

In phase one, data were collected by a post-questionnaire capturing data from the group of general nurses and public health nurses (n=55) after their first practical training week in October 2008. They were trained in two groups divided by the teachers. The questionnaire was entirely composed of open questions. Students were asked to write about their experiences, thoughts and feelings on the practical training week. All the answers were classified using content analysis. Each questionnaire was first read by an author and then categorised by a meaning unit (phrase) and labelled. These meaning units were classified by codes (same topic). Using these codes the author created subcategories and categories. All these categories were created as a theme (see table 1), (Graneheim & Lundman, 2003, 106–108.)

In phase two, data were collected from half of the group (n=27) after their second practical training. Because there were two groups of students, the author selected group 1 by lottery in front of the students in the classroom. Data were collected by video recordings, field notes, observation and the stimulated recall method (STR) (Buitink, 1993; Calderhead, 1981) during four days when the students (n=27) were studying in the ENVI in December 2008.

In the STR method, training sessions were recorded on video and afterwards a researcher and participants watched certain parts of them and analysed the meaning together. The researcher helped students with these situations by asking questions about the subject to get know the experiences in action (Buitink, 1993, 198–199.)

In training sessions the students (n=27) were divided into three teams (A, B, C) by the teacher; each team experienced the same clinical skills training during these days. Selected parts of these training sessions were shown to the students after one or two days and they could see themselves in action while they still had the training sessions fresh in their memories. These sessions were used as stimulants and the students described their learning experiences about the environment in a group interview setting which was video recorded. Students were invited to participate in the same training teams (A, B and C) of 6–10 people, in the classroom which the author had reserved. The author pointed out to the students that taking part in the interview was voluntary and that students had the possibility of skipping the interview. The interviews of focus groups lasted 30–40 minutes and the questions included a) reality of the environment: the human patient simulator, b)

working in the environment: pairs and teams, manual skills, integration of theory and practice, feelings and motivation.

The author transcribed the interviews and read them through several times. After that the text was divided into meaning units that were condensed from all the small group interviews. After that group themes were compared and collected with similar themes together. These themes were categorised and coded. The codes were compared based on differences and similarities and sorted into sub-categories. Preliminary results were presented to the students by the author and they had the possibility of giving comments about the results. The students were asked to verify the accuracy of the interpretations. Categories were compared to theories and then the final categories were created.

Permission to perform this research was first requested from the institution and then from the students; first verbally and then also in written form. Half of group 1 (n= 27) promised to participate in this research. Before every training session the researcher met and asked the group if they were still ready to participate in this research. All material is confidential and only used by the author. Material is stored in a locked closet. Research material will be presented at conferences, only with the permission of those students who appear in the video.

5 Results

5.1 What kind of learning experiences did students have in their first training period in ENVI?

In this study the novice nursing students' learning experiences during the first year studies in the ENVI environment look as if they were becoming a part of their knowledge, skills and preparedness and how to use them in a productive way (Säljö, 2001, 153; Wells, 1999, 304). The results of the whole group (n=55) suggest that the first experience can be described as "Environment feels real and a safe place for training the skills for the future." Categories and subcategories are: experiential (reality of the space and simulator), mastery of skills and knowledge (training and repeating, readiness to work, security and integration) and emotion (feelings and motivation). (See table 1)

Table 1. Categories and theme of learning experiences of students (n=55) in their first training period in ENVI based on questionnaire.

Theme	Environment feels real and a safe place for training the skills for the future.							
Category	Experiential		Mastery of skills and knowledge				Emotion	
Sub-category	Reality of the Space	Reality of the Simulator	Training and repeating	Readiness to work	Security	Integration	Feelings	Motivation
Codes	Environment and training feels real. (n= 16) Space feels small because the group is big. (n = 8)	Human patient simulator feels real with vital functions and communication. (n=13)	Human patient simulator gives a possibility to repeat and train the nursing operation (n = 18)	Environment gives preparedness for training for real working life. Equipment are well-known and you are more sure of you self. (n = 11)	You can train safely with different kind of treatments with human simulator and equipment without endangering real patient's life. (n= 13)	It helps you to integrate theory and practice, remember things better and retains it in your mind. (n= 10)	The environment can amaze, inspire, surprise and scare. (n = 13)	Study in environment brings alternation, gives more motivation and feels meaningful. (n = 15)

Environment feels real

In Urie Bronfenbrenner's (1979) micro system, the nursing world, students described their first contact with the community of practice and contextual realities (Kneebone, 2005, 550–551). The environment seemed real, lively and credible to the students and gave them an idea of reality. The virtual reality enhances the experience of reality. The only worry was the large size of the group—because the environment was small and uncomfortably warm.

> *"There you can train your manual skills and the virtual background gives you a feeling of reality."* (Student 19)

For the students the human patient simulator is life-like, like "a real patient" who's vital functions change and it is possible to communicate with it.

> *"I take notice to how alive the dolls "look like" and how real their "behaviour" feels and looks."* (Student 12)

Students created their picture of nursing reality and experience which was interesting and even exciting, like in the "real world". They were attaching to the nursing world and forming their physical and a cultural tool kit (Säljö, 2001, 27, 71).

The mastery of skills and knowledge starts to take shape

For the novice students the possibilities to repeat and make mistakes give the feeling of safety in training and they can approach the clinical skills. Learning is also easier in a safe situation and a realistic environment. The idea of a "zone of proximal development" is happening with the development of skills (Vygotsky, 1978, 86). Students describe how they can repeat and train the skills without endangering real patients. It gives them readiness for work and they get familiar with the equipment. You remember things better and store them in your mind and integrate them with theory.

> *"The fact that you can safely train here in this real environment makes you relax and learning is easier."* (Student 21)

A simulation environment provides the integration of theory and practice and aids preparedness for future practice. They are in "system of boundary" where "the coupling" is happening. (Seikkula, 1994a, 96–100; 1994b, 404–405)

The environment awakes emotions

In socio-cultural learning the emotions are a psychological part of the tools (Säljö, 2001, 153) and affect the motivation in learning (Kneebone, 2005, 551). The emotional climate in the students' answers was described as exciting, wonderful and even frightening.

> *"Everything is so new and strange—evens a little frightening. But it is also very interesting."* (Student 10)

Studying in the environment gives a change from the lessons and gives more motivation to the students and feels reasonable in spite of strong emotions.

> *"I am always waiting for the next lessons with interest. There is always a feeling of doing."* (Student 14)

The students' first learning experiences in ENVI are very positive. They think that the scenarios are realistic. It gives them the idea of reality and the context is professional. Students are becoming a part of an expert community (Wenger, 1998). There is the possibility for experience, mastery of skills and knowledge and emotions. There is happening the coupling in to "a boundary system" and preparing for the future.

5.2 What kind of learning experiences did students have in their second training period in ENVI?

Results from the students´ interviews (n=24), in December 2008, after their second period of training suggested that practical skills were improved and the evaluation of training and criticalness was awaked. This theme about the students' learning experiences follows five categories and nine subcategories: context (space is realistic), skills (experimental by repeating the performance and model of learning given by teacher), evaluation (instant feedback and fixing of errors and observing the others helps learning), emotions (experiential by feeling of insecurity and difficulty of empathy) and collaboration (interaction is best in the small groups and processing together) (see table 2).

Table 2. Students' learning experiences in the second training period (2008–2009) in ENVI (n=27) based on interviews.

Theme	Practical skills were improved and evaluation of the training and criticalness awake.								
Category	Context	Skills		Evaluation		Emotions		Collaboration	
Sub-category	Space is realistic	Experimental by repeating the performance	Model of learning by teacher	Instant feedback and fix errors	Observing the others helps learning	Experiential by feeling of insecurity	Difficulty of empathy	Interaction is best in the small groups	Processing together
Codes	Feels realistic and experience was fine, Did not remind us of a traditional class. The virtual environment is not utilised. Important to perceive places and the location of the tools. Enough tools. With the human patient simulator the performance must be done correctly and well. The voices bring a feeling of reality	The repetition helps to remember a proper performance. Second time one can think what must be done and remember.	Teacher shows the right performanc e and gives an example. The model performanc e in the beginning. Training in stages and by guiding.	Instant feedback from teacher about the performance and fixing the errors Encouraging criticism Teacher would not say everything at once.	Learns and perceives the wholeness from the following of others. Learns from others' mistakes and do not make the same mistakes. The others can be followed for longer. Notice others' progress	Wondering and forget-ting will stretch when the others look. The stretching has an effect; the information disappears You can't say anything reasonable. The experience of the nursing field is forgotten. In action there is confusion and uncertainty particularly at the beginning	The measures are made to the right patient, but the talking is affected. Empathy is difficult, even there is vital functions. One's own role is unclear so it is difficult to empathise.	In big groups there is nothing to do for all: sitting and watching the others. In a four person group all are working. With a pair you are learning the wholeness: division of labour, skills are growing, and you can do all the sectors. With a pair you have to work like in real working life.	Possibility for asking is important all the time in the process. Working alone is not so simple; there is no-one to ask. The possibility to plan the case, share the roles together and fit the division of labour.

Environment feels realistic

The context feels realistic and is still positively received and it felt better than an ordinary classroom. With the human patient simulator it is possible to train correctly and well and the voices bring the feeling of reality. The students did not pay attention to the virtual environment. It was in the background but not a part of the action.

> *"I didn't think about it at all. Only at the end I noticed that it was there."* (Group A/Student 4)

Students were focusing on the manual skills and familiarising themselves with the tools, but sometimes they didn't know where the tools were or they didn't remember them. It takes time to get familiar with the physical tool kit and move the limits of the practise and intellectual capability (Säljö, 2001, 27, 71).

Skills were improved by repeating the performance

The human patient simulator is a good training tool: you can train the skills without feeling rushed and learning by doing. It is not real but it gives them an idea.

> *"Well it is not feeling so real, but a cold sweat comes…., What comes is a feeling like, it could be like this somehow, and you must take care of this better…*(Group C/Student 6)

According to the students' their manual handling skills improved because they were able to repeat the simulation, which promotes safety (Matveevskii & Gravenstein, 2008, 169). The students described how the second time one can think what must be done and remembered.

Students also hoped that the teacher would show them the right model, when they didn't know how to do it. They wanted the training to be done phase by phase and to be directed through it.

> *"But it would be nice, if they show us the example by themselves.* (Group C/Student 1)

Students started to master the cultural tools, which were physical, and it must be done well. (Säljö, 2001, 153).

Evaluation became important

The students preferred it when a teacher would correct errors and demonstrate the task. They wanted immediate feedback from the teacher (Jeffries & Rogers, 2007, 26). On the other hand they wanted the teacher not to speak immediately all about the performance. They wanted to discover some things by themselves.

The students learned from watching each other, which helped them to notice their own and others' errors. They also gave positive feedback to each other and changed their actions after the first drill. Students could see their progress from each other.

> *"Yes it is influencing, if we are doing the same thing as the others and you are the last one…It is the easiest way of doing, because you can see the errors of others…you are not making those same mistakes."* (Group B/ Student 10)

Evaluation and critical thinking are prerequisites on the way to expertise and feedback is a crucial component of it. Expert assistance is vitally important and such assistance must be judiciously applied (Kneebone, 2005, 550). In order that a student can put forward the concept of a "zone of proximal development" (Vygotsky, 1978, 86) there must be an evaluation by a teacher and within the pairs with whom they have been working.

There were feelings of insecurity and difficulty of empathy

Students were wondering and forgetting things. In some cases the matters remained unclear. Sometimes students were nervous and forgot what to say and what they had already learned. Sometimes even their earlier experience of the nursing field was forgotten. Training can be described by the word insecure. One student said that the first reaction was panic but then it went away and there was no problem.

> *"It is like that; I can, but then when that situation comes up… I am getting so panicked that I can't get them out of my head soundly."* (Group A/Student 7)

Students did observe that it was sometimes difficult to notice the vital functions of the human patient simulator. There was a feeling of acting, it was difficult to empathise and the situation did not feel real. Further, it felt funny talking to the "doll". (cf. Jeffries & Rogers, 2007, 24–25.) Even though the action felt clumsy the students' opinion was that the training was good.

It was important to have a role in training, because it helps in empathising and you know what to do and what is expected.

> *"At the beginning the teacher can deal out roles, so that you are now the leader and you are doing that and that."* (Group A/Student 5)

In simulation learning there is a strong emotional component, which can be positive or negative. The goal is to take over the clinical skills; it can be easier when you have a clear role. This needs a warm-up session which helps learning.

Collaboration and processing together help learning

In big groups students didn't have enough to do and the situation was sometimes disorganised. Some were sitting and watching others. The students suggested that they should work in pairs and in small groups. They learnt the whole range: the division of labour, skills increase and all the sections were done (see also Kneebone, et.al. 2004, 1098). Debriefing in small groups helped to examine what happened in situations and what ones own role was in these cases.

> *"It should start in smaller groups."* (Group A/Student 7)

Stand-alone training was assessed as good and bad: it is possible to practice, but there is no teacher to ask for help if you don't know what to do. Feedback and the possibility of asking for help from a teacher are important because you can't go on without guidance.

In the small groups students planned the task, what they can improve and how to handle the situation. They were arranging what to do in advance and who is leading the situation and how to share the roles.

> *"It has a big meaning, when we were thinking it by ourselves. That was how we can do this better, and what we are searching for and what we were maybe leaving.* (Group A/Student 4)

Students acquired some knowledge, skills and preparedness and started to use them in training situations. They reflected together on how to use them in a proper way. They also thought about the future and how to learn in the best way and take over the situation. (Säljö, 2001, 153.) Students were coupling themselves to the professional context and taking a part in the expert community (Wenger, 1998, 100–101).

The learning experiences were different compared to the first training period. It can be seen that the environment still felt realistic and skills were trained. Repeating is important but now there was also a requirement for the right model. Evaluation is also expected. To take over the physical toolkit is an important part of the training which also put pressure on the training. Collaboration is also an important area in learning. Reflecting together, students created a new system and moved the limits of their practice and intellectual capability (Säljö, 2001, 27, 71; Vygotsky, 1978, 86.)

5.3 Limitations of the Study

The study is limited, as it presents the results of only a single case study sample. However this study gives us important information about the use of a virtual and simulation based environment with a group of novice nurses. It should also be acknowledged that in the focus group situation it can be possible for the views of strong individuals to dominate and the views of all individuals are not always accessed. That said, those students contributing did verify the data analysis and had an opportunity to challenge the interpretations drawn.

In focus group situations some of the students were giving their opinions and others were quiet. So the researcher needs to ask and revise the others' opinion. Group dynamics can also be seen in interview situations.

6 Conclusions

This research described the learning experiences of some first-year (2008–2009) general nursing and public health nursing students which they had while training in a virtual and simulation-based learning environment. It also described novice students' learning experiences. This provided an opportunity for the students to familiarise themselves with the clinical environment in a safe setting and offered them their first experiences of nursing. Therefore, it can also be considered a cultural environment.

The virtual environment needs to be the focus of the case in order for the students to communicate with it, because an immersive experience will not be created by itself. Empathising in the ENVI environment requires warming up, which is a challenge for the teacher.

For the students, the ability to practise their skills meant that they were prepared for the future. However, it was shown that the simulation environment leads to increased pressures. This is because in simulation-based learning, there is a strong affective element of learning experiences that can be taken on. To overcome these pressures, it is important for teachers to complete warm-up exercises and prepare students for the simulation environment. Additionally, group size is important and should be small (8–12 persons) to allow the teacher to monitor the students' performance and to step in if necessary. Immediate feedback was highly valued. Simulation can also offer the benefit of added student learning as they learn from observing the performances of colleagues and from the feedback that they receive.

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Personal Learning Environments

Linking school's learning environment to students' personal online environments: students' experiences

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This paper discusses the possibility of connecting learning environments used in school to students' personal online environments, in this case Facebook. The idea is to benefit of the interactive and collaborative nature of social software and its popularity among today's students. The idea of the pilot is to support students' interaction, their reading of each other's work by linking students' course blogs to their Facebook profiles. By connecting these environments, students are notified in their Facebook feeds when another student writes a new entry to his or her course blog.

Results from the study indicate that students' opinions of using Facebook for learning varied from positive to negative. It seems that some students found the use of Facebook motivating and an easy way to keep abreast of others' writings. These students brought up that the use of Facebook increased their reading of each other's blogs. On the contrary, students with negative opinions indicated that they do not use Facebook for learning; they were not interested in reading each other's blog entries. They did not find interacting, reading and commenting each other's work important. In this paper, we outline theoretical aspects, technical details and students' experiences of the pilot study.

Keywords: article template, guidelines for authors, paper demonstration, structured abstract

1 Introduction

This paper provides an insight into a way to use social software for supporting students' interaction and collaboration. Background for the pilot is based on the assumptions linked to the net generation (c.f. Tapscott, 2008) and possibilities of social software for collaborative learning (c.f. Ferdig, 2007). Net generation refers to today's students, indicating that the current generation has grown up in the knowledge society with different ICT tools and the Internet. The assumption is that these students have a readiness to use the Internet and other ICT (Tapscott, 2008). It seems that students are familiar with especially social software for communication and building networks such as Messenger and Facebook (Valtonen et al., in press). There is great variety under the label of social software. Common for all is users' active role as producers of contents and emphasis on interactive and collaborative activities (Alexander, 2006). These features align well with the practices of collaborative learning (Ferdig, 2007) and provide interesting ways for developing learning environments.

These topics are both important and challenging for educational institutions. Schools and universities should provide students with skills to take advantage of different information and communication technologies (ICT), including social software, for learning. In order to study the possibilities of specific social software, namely Facebook, for supporting students' learning, we restructured the course *Net communication and learning environments* at the University of Eastern Finland. The aim of the restructuring was to focus the content more on the net generation skills and use of social software. The course work consisted mostly of independent or small group online tasks. We used the Moodle environment as the basic background and the tasks included making use of blogs, wikis and Facebook.

In this study, our focus is firstly on how the use of social software affects students' interaction during the course, and secondly, how students react to connecting school activities to their personal Facebook profiles?

2 Theoretical background

2.1. Collaborative learning

ICT tools have been widely used for supporting students' collaborative learning. Dillenbourgh (1999) defines collaborative learning as interaction among people that triggers the mechanism of learning. A central mechanism for learning is the creation and solving of cognitive conflicts i.e. situations where students' earlier and unique knowledge structures conflict with the information they receive from the current situation. Favourable situations for occurring and solving cognitive conflicts are collaborative learning situations where students' different knowledge structures and interpretations about the content to be learnt come up. Students have to cope with each other's ideas and interpretations to solve the conflicts, to learn (Weinberger, 2003).

In order to make collaborative learning successful, it demands active participation, active communication and exchanging interpretations, being aware of each other's ideas. To meet these conditions, several approaches have been developed. For fostering activities of collaborative learning, so called scripts, i.e. detailed instructions as to how to act in a collaborative learning situation to make the best of it (Dillenbourg, 2002), have been produced. In addition, different applications for supporting students' awareness of the activities in process within the group have been developed (Buder & Bodemer, 2008; Janssen et al., 2010). The aim of these tools is to aggregate information about the activities within the group and to provide this information for students. The expectation is that this information will lead to better group performance in the form of more active and equal participation in the group activities (Janssen et al., 2010). Awareness of each other and students being acquainted with each other have also been noticed to be important elements in collaborative learning. According to Jones and Issroff (2005), social affinity and safe environment are vital elements of successful collaborative learning.

Collaborative learning, in other words interaction and sharing ideas and perceptions, aligns with features of web 2.0 and especially with social software. Instead of mere consumers, users of social software create and participate, acting simultaneously as readers and writers (Maged et al., 2007**;** Alexander, 2006). In recent years, there has been strong emphasis on applying social software in learning. Ferdig (2007) suggests that social software could be used as a space for scaffolding, collaborative knowledge building, platform for publishing artifacts, and for building communities of practice. Some social software, such as blogs and wiki-environments have already established themselves as part of everyday teaching and learning in schools. Yet, some social software, such as Facebook, are in the ambiguous situation where their appropriateness as a tool for learning is under consideration (Kabilan et al., 2010).

2.2. Net generation and knowledge society

In addition to its characteristics, social software is also interesting for teaching and learning because of its popularity among today's students. Today's students have been characterised as net generation, indicating that the current generation has grown up with different ICT tools and the Internet. The assumption is that these students have a readiness to use the Internet and other ICT that could be taken advantage of in school (Tapscott, 2008). The expectations concerning net generation have been criticised (Bennet et al., 2008) but it seems that at least net generation students' familiarity with social software cannot be disregarded. According to Valtonen et al. (submitted), especially social software for communication and building networks such as Messenger and Facebook are actively used among most of today's students, typically on a daily basis. The challenge lies in that students do not necessarily know how to use these software for learning (Kvavik, 2005; Valtonen et al., 2011). This, however, seems reasonable as they very seldom have opportunities to use different software for learning in school. Lonka (2008) argues that the situation is problematic when pupils are used to employing different technologies at home but when they come to school they have to leave these "thinking prosthesis" home and adapt to traditional learning methods.

It seems that today's student generation possesses unused potential for learning. According to Hartman et al. (2007), students of the net generation have made the Internet the nexus of their social lives. This is a challenge for schools; school cannot profile itself as a separated area with practices that do not meet students' world. According to Sanier (2010), methods used in school are rather designed for industrial age than information society. Models used for learning are designed rather based on transmission of knowledge than students' active

participation and collaboration. Social software, on the other hand, provide ways to foster collaborative learning and what more, students seem to already be familiar with them.

Teachers and schools should take advantage of this and teach students how to use ICT for learning. This inclination is noticeable, e.g., in the research and development of so called Personal Learning environments (PLE). The aim of PLEs is to make use of social software and students' assumed skills to use ICT by allowing them to build their own learning environments (Attwell, 2007; Hietanen & Valtonen, 2010). Implementing PLEs fosters students' central role by setting them in the role of administrators of their learning environments and also, by stressing self-regulated learning (Attwell, 2007).

In this study, we used Facebook as part of the learning environment. The aim was to link online environments used for learning to students' personal Facebook feeds using RSS feeds. Based on earlier studies, it seems that students typically use Facebook on a daily basis. Our aim was to take advantage of this motive and use Facebook for learning, to link learning in the university with students' leisure time. The hypothesis concerning the use of Facebook was that active presence of school activities in the form of RSS feeds in students' Facebook profiles would increase the number of visits to materials produced by their peers and thus increase the awareness of each other's work and ideas. From collaborative learning point of view, reading and being aware of each other's work and ideas is essential for learning.

3 Research approach and methods

This pilot study was conducted as part of student teachers' course *Net communication and learning environments*. The course included 6 introductory contact lectures, 2 hours of project presentations and 8 hours of small group teaching in computer laboratory. The aim of the course is to provide first year student teachers with basic ideas about how ICT can be used to support learning. With the reconstruction, we also aimed to provide student teachers with concrete experiences of how tools of social software can be used for learning. Altogether, there were 147 kindergarten, primary and secondary teacher students participating in the course (seven groups).

At the beginning of the course, students reflected their background in regard to using ICT in general and using ICT in education. They built their own blogs using Blogger and linked them to each other's blogs using RSS feed. The aim was that during the course, students would write their learning assignments to the blog and read and comment on each other's blog entries. Students were instructed to read each other's blogs, aiming at sharing ideas, interpretations and learning experiences. In addition to blogs, teacher built a Facebook profile for the course and linked all the students' blogs to the profile using RSS Graffiti –tool. The aim of the environment was to connect the blogs used for learning and the Facebook profiles used for leisure. When a student wrote an entry to his/her blog, an announcement of a new entry would show in each student's blog and at the same time, in each student's Facebook profile.

Participation in the Facebook pilot was voluntary. The participating students were allowed to skip one learning assignment and instead, they wrote a short essay about their experiences. Altogether 50 students participated, 46 filled in a questionnaire after the experiment and 47 students wrote an essay. The questionnaire focused on both students' activity of using Facebook and reading each other's blog entries and their experiences and attitudes toward the experiment. The same was the topic for the essay which gave the students' view in their own words. Hence, the study can be seen as a mixed method study where quantitative and qualitative data support each other. The research questions are:

> How does the use of social software affect students' interaction during the course?
>
> How do students react to connecting school activities to their personal Facebook profiles?

The analysis was conducted in two phases, first with quantitative data and second with qualitative data. The method can be described as a mixed method approach. Mixed method with different data sources and methods allows expanding the understanding, providing deeper insight into the research topic (Creswell, 2003).

The quantitative data was analysed using principal component analysis, aiming at constructing the subscales for measuring students' attitudes toward the experiment and effect on interaction and motive during the course

(Table 1 and Table 2). After this, students were divided into three groups based on the results of the subscale with regard to students' attitudes. Students were grouped in alignment with quartiles (Q1, Q3). The second phase of the analysis was the analysis of students' essays about the experiment. The essays were analysed using open coding approach (Gibbs, 2007). The aim was to elicit more profound information about students' experiences and reasons for their opinions about the experiment.

4 Results

The results of this study are divided into two parts: first, the results related to the reactions to using Facebook in education from the quantitative data and second, the results based on qualitative essays on using Facebook during the intervention. In general, altogether 118 feeds were submitted to Facebook. The RSS feeds typically consisted of 50 to 70 first words of the blog entry, which is 5 to 7 lines of text.

4.1 Students' reactions to connecting school activities with their personal Facebook profiles

Questionnaire contained statements using a 5 point scale, 1 indicating strong disagreement and 5 strong agreement. The first three statements were merged into a subscale for measuring students' attitudes toward the experiment (alpha value .84). The subscale consisted of the following statements:

- Course contents on my Facebook profile did not bother me
- I could use Facebook as part of my studies also in the future
- Facebook is well suited for higher education learning

Respondents were divided into three groups that align with quartiles (Q1, Q3) of distributions of the subscale above (Table 1):

Table 1 Attitudes to using Facebook on the course

Groups:	Average of the subscale	N
Neutral attitude	2.8	22
Negative attitude	1.4	11
Positive attitude	4.1	13

These results indicate that students' experiences varied. Most of the students had a rather neutral opinion (N=22). Results of the *Negative attitude* group (N=11) indicate that they do not want to use Facebook in their studies while students in the *Positive attitude* group (N=13) find Facebook suitable for their studies.

The second part of the questionnaire discussed the effect that using Facebook had on interaction and motive during the course. The following statements were used for building the second subscale (alpha value .82):

- Use of Facebook increased awareness of the work done by my peers
- Facebook helped me familiarise myself with other students' work
- Being reminded of other students' work on my Facebook profile increased my motive for the studies

When compared to the three groups described above, we can see differences.

Table 2. Experiences of using Facebook on the course

Groups:	Average of the attitude subscale	Average of the interaction and motive subscale
Neutral attitude	2.8	2.9
Negative attitude	1.4	1.1
Positive attitude	4.1	3.4

The general attitude toward the experiment aligns with students' experience of the effect of using Facebook. Students with negative attitude indicated clearly that using Facebook did not increase their awareness of each other's work or motive for learning. On the contrary, students with positive attitude indicated that using Facebook increased their motive and awareness of each other's work.

4.2 Ways to use Facebook during the course and their effects on the learning process:

In addition to the questionnaire research data was also collected by students' essays about the experiences. Results from essays provided more detailed insights about students' experiences concerning the use of Facebook as part their learning environment. Essay responses aligned well with the quantitative responses i.e. students in the negate attitude group indicated mainly negative experiences etc. Within the category neutral students brought uo both positive and negative aspects of the experiment. Next paragraph provide insights for experiences of the experiment, reasons and affects.

Why did I not use Facebook?

The main reason for not reading each other's blog entries, even though they were actively presented in the Facebook, was simply that students were not interested in each other's writings. These students' responses brought up that students did not "understand" why they should read the work of their peers. For these students, the presence of information about the work of their peers in Facebook did not lead to any action.

> *I did not read any feeds related to the course in the Facebook. To be honest, I did not understand the reason why I should have read them, especially I did not understand what good would it would be for me, what is the additional value…*

> *Use of Facebook would probably have helped me to read other students blogs, but I did not do that. I did not find it important or even meaningful because I just wanted to get my own assignments done.*

Some students brought up that they consciously did not read each other's work. Reason for this was that they did not want to copy each other's work and some students even thought of it as cheating.

> *I specifically tried to avoid reading other students blog entries when I was studying because I did not want to use others' ideas instead I wanted to think on my own.*

One reason for not taking advantage of the experiment was the "inflation" of the feeds. Students indicated that first they read the headings and the short text of the feeds in Facebook, but when the amount of feeds increased, they did not bother anymore. Some students found the large amount of feeds annoying. Typically, inflation of the feeds was linked to lack of time to read each other's texts. Students brought up that they just did not have time to follow each other's writings.

> *At the beginning I every now and then read the texts of the feeds but after a while the feeds become annoying. They were frustrating when they filled the whole first page of Facebook so I turned the RSS of.*

Facebook did not affect the reading of other students' blogs because I just did not have time to do anything not obligatory.

Why did I use Facebook?

For students that were interested in each other's ideas and work, Facebook was a well functioning tool that made it easier to follow recent updates and provided an easy access to each other's blogs. Many of the students brought up that the use of Facebook and the current feeds from the blogs of their peers increased their reading of each other's work. Students found it positive, indicating that the presence of learning activities in their personal Facebook profiles increased their awareness of each other's work and learning.

I usually read the text in the feed and if it was interesting I read the whole blog entry. Without the Facebook feeds I probably wouldn't have read other students texts or visited in their blogs.

Use of Facebook increased my awareness how other students are proceeding.

I can say that because of Facebook I read a lot more other students' blogs.

Students also noticed that the presence of feeds increased their motivation. Being aware of each other's progress worked as a stimulus for finishing their own work. Also, the ideas of their peers provided ideas for their own work and learning.

It was interesting to see how other students think and proceed in their assignments.

I felt the Facebook as a good thing. It reminded me about making my assignments. In addition I could read each others' texts directly from Facebook, so that I was able to compare my own assignments to each others' work…

Feeds in the Facebook reminded me about to do my learning tasks

Interesting feeds in Facebook

Students also brought up that they usually only read the feeds of their friends or students in the same group. In this experiment, the 50 students were from seven different groups and did not know all the peers participating in the experiment. Students were most interested in the feeds of the students they knew.

Feeds in the Facebook profile caused interest and when interested I every now and then checked what other students had done. Especially when the blog entry was made by some students I know.

Texts of familiar students, especially students from my class, I read with great interest.

The same seemed to be the case concerning the contents of the texts. Students indicated that they were interested in reading the feeds and blog entries of the topics they also had chosen, topics that were familiar to them.

Via Facebook I usually read only the blog entries that were familiar to me, that I had tried myself.

I usually read others' blogs when I noticed that they had written on the same topic as I had.

Facebook as a part of learning

Students brought up that use of Facebook worked rather well and they were happy not having to learn to use new software.

I think that it was good that in the front page of Facebook you could see the heading of the blog and first rows of text. It helped me to grasp on the blog texts.

…actually the use of Facebook reduced the amount of work during the course, because the Facebook was already familiar. I did not have to learn any new software and its characteristics.

It seems that based on the quantitative results, students' opinions of the experiment varied aligning with the grouping. Based on the essays, most of the students especially in the neutral category indicated both positive and negative aspects in using Facebook for learning.

> *I see the use of Facebook both as a good thing, but I also want to keep my leisure separated from school. It would be good that all the staff would be in the same place, but would I like to always see learning assignments along with feeds from my friends' postings? Assignments would encourage me to do my tasks but don't want them on the first page.*

As seen earlier, some students did not find this important; they were not interested in reading each other's work. Some students brought up that in different learning assignments, the use of Facebook would have been more useful.

> *I think that, if the course content and type of assignments would have been different the use of Facebook could be more interesting.*
>
> *Facebook is suitable for conversations, creating new ideas, coordinating projects etc. and that is it, I would not use Facebook for other kind of learning activities.*

5 Conclusion

Based on these results, we can see that students' opinions and experiences of the pilot varied from strongly negative to very positive. Some students indicated that the use of Facebook increased the reading of other students' blogs. By this, we can assume that the method can be beneficial for collaborative learning as students can see each other's ideas and interpretations (Dillenbourg, 1999). Also, it can be considered one way to increase students' awareness of the work and ideas of their peers. In this sense, Facebook could also work as an awareness tool (c.f. Buder & Bodemer, 2008).

It seems that a major reason for negative attitudes and not taking advantage of Facebook was based on students' own motives for reading each other work. In this pilot, the assignment was mainly to use blogs for students' own assignments and reflection. Students were encouraged to read each other's work. Interestingly, some students avoided reading fellow students' feeds and blogs to avoid plagiarism. Our interpretation is that not reading each other's work is related to students' ways to understand learning, i.e. conceptions of learning (c.f. Marton et al., 1993). This is an important result showing that ideas of collaboration and students' readiness for learning collaboratively and actively participating should not be taken for granted, even in the case of student teachers. This result shows that the tool alone cannot change this situation. In the future, the importance of collaboration and students' unique interpretations as a source for learning must be highlighted and learning practices further developed.

Altogether, these results provide an interesting insight into linking students' learning environments to their leisure-based online environments. For future development, it is important to take advantage of different environments for learning and not let school and life outside school become overtly separated. Social software is quite actively used by today's students and we should find ways to take advantage of this potential for learning in school as well as in informal learning. It would be especially important to show students how to use different online environments and software for learning. This was our first pilot study of using Facebook for learning. Results provide pros and cons demanding more future development and research. We will continue with a follow-up study and by characterising typical net generation teacher student profiles.

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Using Bookmarks and Tags for Creating Students Personal Knowledge

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This article is about how social bookmarking environment Delicious was used for helping students to organize the course information and support knowledge creation. The meaning of this case study was to investigate how bookmarks and tag clouds can be used for organizing teaching and how they affect students learning behavior.

Keywords: social bookmarks, tags, tag clouds, delicious, knowledge.

1 Introduction

If we look at the common practice how teaching is organized in secondary schools and in classes then students are forced to follow the teacher. They have to study materials in the order that is defined by a curriculum, book or teacher (Lin, 1995). They have to conduct learning activities organized by the teacher. This is a common practice because schools can be seen as teaching factories. If the process is organized in this way it is possible to provide a lot of different topics in a short time period being an effective, low cost method. But what do students learn during this period? They can have a wrong impression that a teacher is the only person who knows everything and students are successful if they do what ever they are asked to do. But in real life there is no such kind of wise leaders who will tell what you have to do. There is no ready-made knowledge. Everybody has to collect information piece by piece and to organize this in to meaningful knowledge. Students don't learn at schools how to organize and structure information in a way that makes sense for them.

Yet, we are witnessing an unprecedented explosion in available information and the total amount of information is constantly expanding (Candy, 2002). This is a challenge for everyone. For successful performance individuals are required to acquire techniques and skills for using the wide range of information tools. It is important to be able to recognize when information is needed and have the ability to locate, evaluate, reorganize and use effectively the needed information.

With the digitalization the practices of teaching and studying have not changed much. Most of the virtual learning environments (VLE) support traditional teaching methods. Online courses represent teacher-centered constructions. Learning materials are presented in fixed order and learning activities are related with the timescale. For instance computer-assisted instructions (see for example Lunts, 2002; Merrill, 1980) and intelligent tutoring/adaptive systems (see for example Hannafin, 1984; Kay, 2001; Papanikolaou & Grigoriadou, 2006) present materials in fixed order. The main idea is that access to the next chapter is restricted unless you have not succeeded the previous one. Neither such approaches nor virtual learning environments offer opportunities for students to practice information seeking, evaluation and selection or reorganizing and structuring information.

One possible way to practice the aforementioned skills is to organize learning activities where students have to extend teacher provided materials and resources with additional information. For example they can reorganize the learning materials and add short comments. In this way they create their own personal portfolio of resources for the course and the content has meaningful value to them.

There are several methods how to present, reorganize and structure information to help students to create personal knowledge. Quite common is to organize students' activities with various social software applications (see for example Anderson, 2007; Evans, 2007; Parker, 2007). Social bookmarking systems seem to have a great potential for supporting the advancement of skills regarding information seeking, organizing and restructuring in meaningful ways.

A pedagogical case study was conducted to test how social bookmarking can be used for organizing the teaching and learning practices in a way that allows students to organize and structure their learning material and resources. Delicious social bookmarking service was selected as a supporting tool. The basic idea of social bookmarking is to collect bookmarks and describe them with tags. By tagging chosen bookmarks individually allows a learner to create her personal tag cloud. This cloud can be treated as a visualization of students' knowledge space. The case study aimed at exploring ways of how bookmarking and tagging with the support of Delicious service can be implemented in secondary school teaching and studying practices; and to what extent bookmarking and tagging of learning material and resources affect students learning behavior?

2 Description of the case study

The case study was organized in one of the secondary schools in Estonia. A small group of 16-17 years old students used Delicious during the entire semester (Jan-May 2007) for the Project Management course. During that period once per week 19 students (5 boys and 14 girls) gathered to the computer lab for 90 minute long lesson. The goal of the course was to get familiar with the project management techniques and tools, plan small projects (like school graduation ceremony, start of the school year ceremony and summer social event) and execute them.

Materials were created and published in LeMill (lemill.net/community/people/martinsillaots/collections/projektijuhtimine). LeMill is a social software kind of environment that enables teachers to create learning materials in collaboration (Leinonen, 2010). In this case the purpose of using LeMill was to make all the course related materials freely available for a wider range of users (not to limit this with the school or class barriers). They are accessible to other learners and also to teachers for further development.

Delicious was used as a supporting tool for managing, collecting and sharing materials and resources for the Project Management course (http://www.delicious.com/martinzillaotz). Social bookmarking and tagging approach was selected because of its simplicity. Making bookmarks to existing content and to describe it by tags is much more faster and easier than adding entries for instance to a personal Weblog or wiki. The number of different features of Delicious is small and they can be used intuitively. There was no need for a long introduction of how to use Delicious. This enabled to focus on rearranging the learning materials, creating a personal conspectus of the course and describing bookmarks with tags. Those tags formed students personal tag clouds that provided extra layer for browsing the course content.

Google Docs was used for students' group work (see Figure 1). All materials created by the students were made accessible through Delicious.

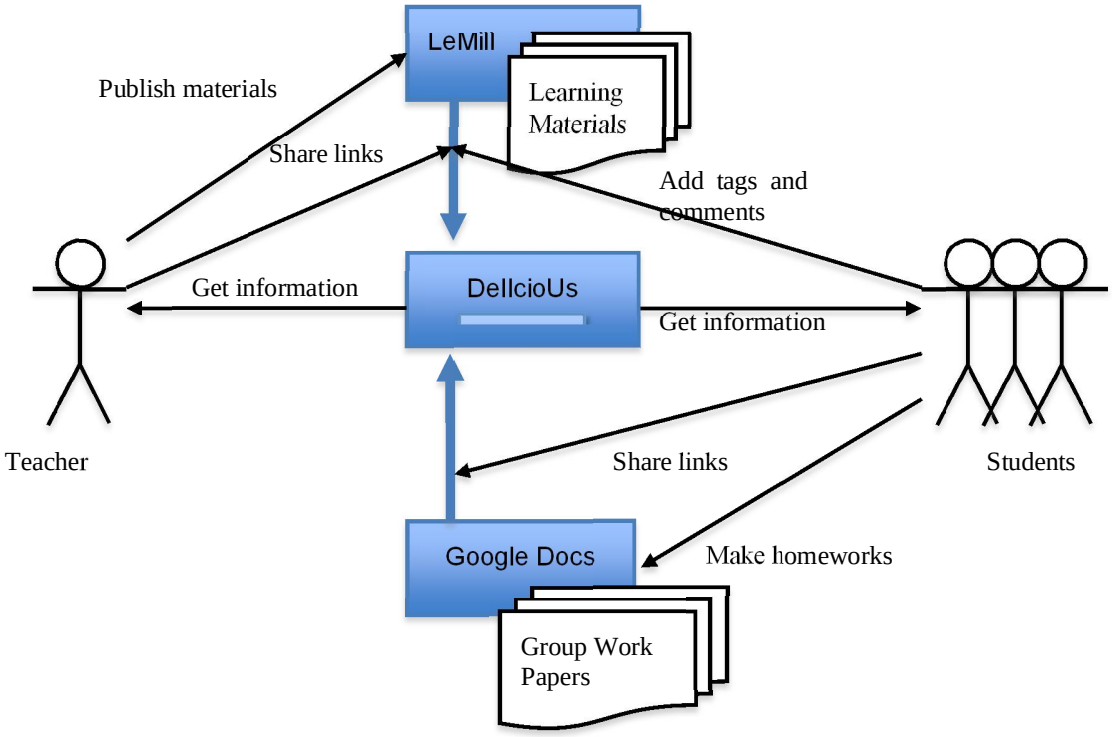

Figure 1. Landscape of tools and services for the course

The overall course structure was as follows:

1. In the first lesson the teacher introduced the goal of the course, methods and tools that will be used during the semester. Students registered and logged in to Delicious. They joined with the teachers' Delicious network. This simplified the delivery of new content.

2. In the beginning of each lesson the teacher presented the topic of the day. Students worked with presented materials and solved group works and published them online. Students created bookmarks to materials provided by the teacher or to their own personal materials and described them with personal tags. To motivate students to create bookmarks and to come up with reasonable tags it was frequently repeated that they could use their personal tag clouds and bookmarks as a helping material during the final exam.

3. Teacher observed frequently how students created the bookmarks and tags. This information was a basis for assessing the current learning activities and planning the correction actions. Based on this information the tagging process was analyzed.

4. Before the final exam students were asked to study the course material. They created missing bookmarks and added tags.

5. Course ended with a final exam. Additionally to the assessment of students' attainments the relationship between the student's knowledge and tag cloud richness was evaluated. Furthermore, students were asked whether they like bookmarking and tagging method or not.

During the course students personal learning spaces started to form. It was kind of a personal collection of learning materials but not only that. Although the main focus was on making links to the learning content students also generated some additional information. Students added tags to the content and formed personal knowledge spaces - tag clouds. Delicious provided also some possibilities for organizing learning activities. For example, students used the comment area of bookmarks for writing down some answers to the material related questions. But most of all Delicious provided a rich set of features how to reorganize, search and filter learning materials. Bookmarks can be sorted by the title or chronologically and filtered by the tags. Tags can be

presented as lists or clouds or grouped in the hierarchical structure by providing different perspectives to the same content.

A final exam was conducted in the format of a semi-structured personal interview.

The exam was organized as follows:

1. Students had to give a suitable visual look to their personal tag clouds. The idea was to check whether they understand the basic concept of the tag cloud.

2. Students were asked to point out one tag (except Project or Project management tag) that describes best the entire course and to explain why this tag is important. The idea was to check whether they see (or is there) the relationship between the importance and frequency of the tag usage.

3. Students were asked to explain the logic behind their tags organized in the groups.

4. The teacher asked two subject related questions. First question was related with the content of the student's personal tag cloud. Tags in the student tag cloud were supposed to give a hint to the student. The idea was to check whether the tag cloud helps the student to find the answers? For the second content related question no direct link was made to the tag cloud. The aim was to check whether bookmarking and tagging method helps to understand the subject?

5. Finally it was asked how they like bookmarking and tagging as a learning method and for how long they spent time on exam preparation? The aim was to explore how the repeating activities affected the final results?

More detail description of this pedagogical case study is available on the blog - http://martinsillaots.wordpress.com/

3 Methodological setting

The pedagogical case study presented in this paper follows the elements of experimental research (Breakwell, Hammond, & Fife-Schaw, 2000). Students in this case study were observed throughout the entire course. A special focus was put on their activities related to individual bookmarking and tagging, but also their use of bookmarks and tags as a supporting material for performing the final exam. Students tag clouds were analyzed regarding their quality, structure and frequency of usage. In addition, the oral exam was used as a data collection method (together with assessing students knowledge about the subject area). A semi-structured interview format was used (Cohen, Manion, & Morrison 2007). Where needed, additional questions were asked to get more elaborated answers and to understand students' use of tags and bookmarks as a way to organize the material. All interviews were recorded for the later analyze. A more detailed description of the methodological choices will be described below in relation to a specific aspect under investigation.

4 Findings and discussion

During the pedagogical case study the following aspects were explored:

1. Usefulness of tagging - A quarter of the students do not find bookmarking and tagging as an useful strategy for studying subject matter.

2. The quality of tags – in general the quality of students' generated tags is rather low.

3. Exploiting the tag cloud - Students understand the overall idea of the bookmarks and tag clouds, but they lack of knowledge and skills to make meaningful use of their tag clouds.

4. The effect of bookamarking and tagging - The practice of bookmarking and tagging do not have a considerable effect on students' learning outcomes.

4.1 Usefulness of tagging

During the final exam students were asked whether they like bookmarking and tagging and whether they consider this as an useful strategy for supporting their studies. As mentioned before a quarter of the students do not find bookmarking and tagging as an useful strategy for passing the exam (See Figure 2). Approximately a quarter of the students (23%) claimed that they do not like tagging, thus, it does not help them to achieve their study objectives. Almost half of the students considered this approach beneficial for their studies.

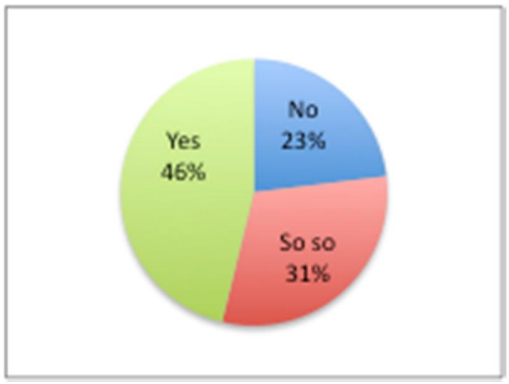

Figure 2. Usefulness of tagging from the students perspective.

Being a new task for the students during their studies, it is rather normal that bookmarking and tagging as a required activity is received reluctantly by some of the students. One can not expect to have a full participation and acceptance from all the students immediately. Obviously a more systematic approach is required together with the examples of its affordances and usefulness.

4.2 The quality of tags

The quality of the tags was observed periodically during the whole semester. The quality was measured by a simple scale:

0 - low quality - tags are missing or are not describing the content of the material

1- average quality - not enough tags (only one tag is added) or they don't describe enough the content or the content is described with sentences instead of tags.

2 - high quality – a bookmark is described at least with 3 tags and they are relevant to the content.

The case study showed that some students have difficulties to create reasonable tags and it was also confirmed during the final exam. It came out that the list of separated words is not enough for students to describe the content of the material. They prefer short sentences or even paragraphs.

It is interesting to admit that the quality of tags had no correlation with the course progress. Despite of the teacher's effort to explain several times during the semester the typical errors, ways to correct and improve the errors and the examples of suitable tags, same mistakes appeared again.

Figure 3. How the course progress affected the tags quality - no influence at all.

The following list represents the most frequent errors that occurred during the case study:

1. A bookmark is created without tags.

2. A longer sentence is entered to a tag field causing a lot of separated meaningless tags.

3. Problems with tags with 2 words (e.g. project management).

4. Only one tag is used in a bookmark description.

5. Using tag "ect".

6. Using numbers in a tag area.

7. Using comma for separating the tags.

The case study shows that there is a need to carry out a series of such case studies to explore the usefulness of bookmarking and tagging, but also to create opportunities and situations for students to practice organizing and structuring their material by using bookmarking and tagging activities.

4.3 Exploiting the tag cloud

The most important part of the exam was answering to subject related questions. Those questions were personally designed to each student based on the information available in their personal tag cloud. In addition to subject related knowledge the aim was to explore the relationship between student's subject related knowledge and a tagging method. Do students find answers to the subject related questions using their own individually created tag clouds? For this purpose different characteristics were taken into account and measured:

1. Did they use their tag clouds or answer to the questions without additional materials?

2. How much time did they spend on finding the answer (the time counting started when the teacher finished the question and ended when the student started her oral answer).

3. How many clicks did the student do for finding the answer (not counting clicking on a "scrollbar" and on a "back" button).

4. How many hints did the teacher have to provide?

5. How correct was the answer?

Usually the students had good skills in navigating in their personal tag clouds. There was no relation between the most frequently used tag and the tag pointed out by the student as the best characteristic to the entire course material. Only 4 students out of 13 selected the biggest word in their tag cloud. Based on their oral explanations there was enough evidence to claim that they understand the meaning of the biggest tag in the tag cloud and they came up with the reasonable explanations why some other tags are more important. Thus, the biggest tag in the tag cloud is not always the most important one.

Unfortunately there is no evidence that individually created tag clouds help students to find correct answers. The outcome is rather opposite. Some of the students did not use their tag clouds at all. They answered the questions without any additional help. When students started to use their tag clouds it was evident that they don't know the answer and even with the help of the tag cloud in most cases their answer was inaccurate. According to the quantitative analysis there was statistically a significant negative correlation (R=-0.278) between using the tag cloud for finding the answers to the questions and the correctness of the answers. Both of the characteristics were measured by the binary scale. For the first and easiest question the correlation was also negative but not statistically significant (R=-0.158).

4.4 The effect of bookmarking and tagging

During the final interview the students were asked how they prepared for the exam and how long it took. The following options shows the frequency of the students answers (the most popular is listed on the top):

1. Add tags to existing bookmarks.

2. Create missing bookmarks.

3. Browse tags.

4. Sort tags in groups.

5. Read materials.

6. Add notes.

7. Monitor tags created by other students.

The case study shows that the activities which were conducted before the exam had the biggest effect on the exam results. Based on the students personal estimation of how long time they spent on preparation and also based on additional observation of created bookmarks and tags just before the exam, the results show that obviously some of the students just copied existing bookmarks and tags without learning and making meaning out of it. Based on this information the strategy for pre exam activities was evaluated and measured with the binary scale (1 - student conducted meaningful activities, 0 - student only copied existing bookmarks). Students who really learned before the exam had better knowledge in this subject (correlation 0.677). The knowledge was measured by the 3-point scale - 1 low, 2 medium, 3 high. This value was estimated based on the question results.

5 Summary

This paper describes an case study with bookmarking and tagging in a secondary school level. It has to be mentioned here that shared bookmarks and tagging is one simple option among a lot of others. The case study created an enthusiastic atmosphere in the classroom. The lessons were interesting and the students participated in the course with a big interest. There was no problem with the discipline (in the computer lab there is always a big risk that students start to chat and play instead of learning). Such a different approach was also interesting from the teacher’s point of view although lessons demanded a more thorough planning and it demanded a lot of time and energy.

The described case study provided no evidence that bookmarking and tagging can actually help students to reach deeper knowledge, to memorize content related aspects or organize, structure and help finding learning materials. According to one of the student claim regarding bookmarking and tagging she mentioned: "I can't see

no difference. Learning is learning." In this case learning results did not depend on what kind of method or tools one is using, but rather on student's personal learning habits. However, due to the limited time period for the case study (one semester) the study also demonstrates that one cannot expect immediately from the students to be proficient in bookmarking, tagging and organizing their material meaningfully. Nevertheless, the study demonstrates that such case studies are worth for a deeper exploration. Thus a more systematic approach should be taken to explore the influence of bookmarking and tagging for students learning habits and knowledge creation.

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Social Media

Using Social Media for Immigrant Inclusion via e-Participation

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This paper reports a study which has been conducted within a European project titled "Immigrant Inclusion by e-Participation", launched in October 2009 and running until April 2012, with the aim to explore the potential of modern social media tools in enhancing social cohesion, inclusion and participation opportunities in decision-making processes for people living in Estonia.

The study addresses the emerging issues with the concept of immigrant in modern European society, and the trends in using modern information and communication technologies and social media among the members of immigrant communities in modern world.

In applying participatory scenario-based design research, the paper is presenting fictional personas, as suggested representatives of linguistic and cultural minorities, helping to identify the background factors, goals and dispositions of different types of users of the solutions to be developed.

The results reported herein, will provide the initial guidelines towards the design of new procedures and tools for various e-inclusive contexts and environments, provided by Estonian local and national authorities, aiming to foster greater e-participation within Estonian context.

Keywords: immigrants, social media, e-inclusion, e-participation, personas

1 Introduction

In the process of developing modern European society, one of the goals defined is striving for building attractive and dynamic societies, along with creating better living conditions and social inclusion, as well as participation possibilities for all people living in the member states of the European Union (EU). As nowadays European countries are highly relying on the use of information and the communication technologies (ICT), the main method for creating an attractive society is to apply ICT in the way it allows more people to take advantage of the information and knowledge created, lessening barriers between various sub-groups among citizens.

In this paper we present the initial results gathered in Estonia, as a part of the activities carried out under the European project "Immigrant Inclusion by e-Participation" (IIeP), which is partly financed by the European Union Central Baltic INTERREG IV A Programme 2008 – 2013, and developed together with five partners, namely: Tallinn University, Institute of Informatics (Estonia), University of Helsinki, Department of Communication, and Palmenia Centre for Continuing Education (Finland), the Finnish Ministry of Justice, and Södertörn University, School of Communication, Media and IT (Sweden).

The study is based on the idea that, by understanding people's collaborative and community building patterns in technology oriented context, it is possible to provide tools and guidelines which will support the greater inclusion of Estonian linguistic and cultural minorities into Estonian society. An emerging approach of design-based research has been applied in the study, aiming to develop fictional narrative descriptions of 4 archetypical users (personas) of the aimed-for ICT systems and solutions. The outcomes of the present study will give input for the IIeP project in developing tools and guidelines for authorities and non-profit organizations for enhancing the participatory activities of citizen communities through social media tools.

2 Immigration and minorities in Estonia

Regarding the immigration issues in Estonia a desk-research was carried out during 2010, on existing data and former studies regarding various language and cultural minorities with immigrant background in Estonia.

According to the Estonian Statistics Board data (as of 01.01.2010) there are 120 nationalities represented among Estonian population, as follows:

Table 1. Major nationality groups among Estonian population

Nationality groups	**2010**	**%**
Estonians	922 398	68,83
Russians	342 379	25,55
Ukrainians	27 722	2,07
Belo-Russians	15 504	1,16
Finns	10 639	0,79
Tatarians	2 445	0,18
Latvians	2 196	0,16
Polish	2 012	0,15
Jews	1 801	0,13
Lithuanians	2 050	0,15
Germans	1 912	0,14
Other nationalities	9 069	0,68
Population in sum:	**1 340 127**	**100**

Major immigration to Estonia took place during the Soviet Time, within last 2-3 generations, partly voluntarily and partly forced by the authorities, resulting in a quick emergence of "great minorities" (Lagerspetz, 2005). Due to historical reasons, the term "immigrant" is not currently in use, but instead several replacing terms such as "foreigners", "stateless persons", "residents" and "new immigrants" are applied when referring to the immigrant population in Estonia.

According to the Estonian Integration Strategy 2008-2013 "new immigrants" are defined as "persons arrived to Estonia after 1991, such as foreign workers, their family members, asylum seekers or refugees" (Estonian Ministry of Culture, 2008). The Estonian Law of Foreigners considers all foreign passport holders residing in Estonia as "foreigners", except citizens of the European Union member states, who hold a unique position regarding legislative terminology and legal status.

Considering the above matters, the study refers to various groups of people with immigrant characteristics in Estonian society as "linguistic and cultural minorities" as demonstrated on Figure 1 below.

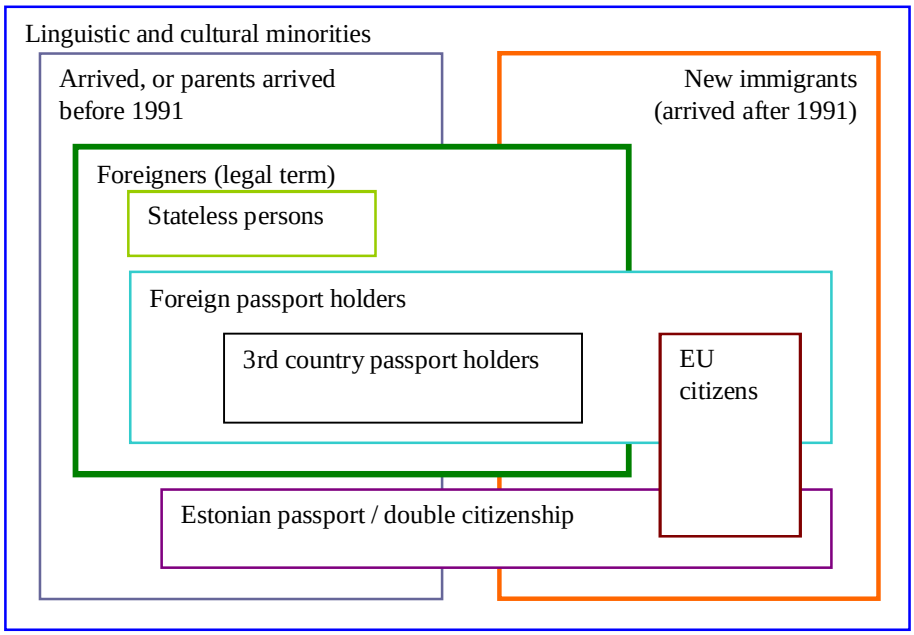

Figure 1. Various terms used regarding members of linguistic and cultural minorities in Estonia.

2.1. Changing immigrant profiles

Regarding the trends of migration within Europe, Bosswick and Heckmann (2006) are outlining that since the 1970s, when recruitment of migrant labour ceased, a key source of immigration to European countries has been family reunification. During the last decades, this category in Estonia is majorly represented by the returning Estonians and their decendants (Lagerspetz 2005, 11), being the holders of Estonian citizenship, and representing 43 percent of immigrants during the years 2000 – 2007 (Anniste, 2009). Accordingly, Bosswick and Heckmann (2006, 19) conclude:

> *"Such individuals are considered as nationals: as migrants, however, they still face many of the same problems of adaptation."*

The traditional concept of immigrant is also changing because of the modern European Citizen mobility rights. Similarly to other immigrating people, the citizens of EU need support and guidance in the process of integrating into Estonian society, while at the same time securing the resident EU citizens with means to exercise their legal right to vote and participate in the local as well as pan-European democratic administration procedures.

These changes on the immigrant concept need to be considered when designing new ICT solutions for facilitating greater e-inclusion and e-participation in Estonian society.

3 Social media and migrant communities

In the last decade Internet has become a hub of socialization, allowing people to connect to one another, allowing the emergence of socialization and cultural diversity never seen before, extending the natural human tendency toward togetherness, to create a world without physical or temporal frontiers (Weaver & Morrison, 2008).

Social media and its emerging technologies are gaining an increased attention in various areas of research. ITU World Telecommunication ICT Indicators Database 2010 (14th Edition) indicate that the total number of SMS sent globally tripled between 2007 and 2010; while the number of Internet users has doubled between 2005 and 2010. According to Nielsen Online (2009), the overall, social networking and blogging already count for more

Internet time than personal email applications. As the penetration of social computing tools, like blogs, wikis, social bookmarking, virtual worlds, podcasts, RSS feeds, media sharing, and social networking sites are becoming easier to use, individuals and organizations see it as an opportunity to launch new collaborative approaches in social engagement.

The share of these social tools seems to be high even within immigrant and ethnic minorities according to Kluzer and Codagnone (2008). In fact according to Nielsen Online (2009) such level of participation is not only describing the younger groups but also older age groups (ages 35-49). Maya-Jariego et al. (2009) show also examples, where the groups often considered at risk of exclusion are using social Internet tools for maintaining and developing their communities and ambitions.

As reported by Borkert et al. (2009), the main research lines on the use of technology by immigrants in Europe identifies clear evidence, which links media, ICT and the diaspora community development. ICT tools are being an important artefact for helping to maintain ties between communities, by allowing a constant exchange of new information between migrants and their home countries. This in addition helps to foster the development of cross-border virtual networks that otherwise would be difficult to achieve, at the same time paving the way to the mergence of a connected migrant phenomena (Diminescu, 2007).

The use of ICT is shaping migrant identities, and preserving migrant collective memory as well as identity, through helping to maintain bonds between geographically separated migrant communities. This is especially important for the so-called second and third migrant generations (Borkert et al., 2009). Additionally, within technologically enhanced social contexts, new identities are being formed and evolving, tailored by each individual's diversity. New immigrant groups are formed therefore, creating new, cross-cutting forms of social solidarity and more encompassing identities (Puttman, 2007).

3.1 Migrants' participation in the society

As Borkert et al. (2009) indicate, the use of ICT is becoming a key factor in fostering migration dynamics and migrant participation in the today's inter-connected society, which also shows that ICT allows migrants to develop powerful participation tools for support activism, and organizing international, regional or local resistance.

As Eurostat (2010) reports, social participation actions, strongly connected with local activities, lead to life satisfaction and happiness. Although not one of the goals of our project, this interesting finding can surely be regarded as a valid context in today's Europe.

As new forms of social solidarity are evolving in society, immigrant contribution with their cultural diversity and experience can be an important key point to address. Thus there is a need to explore the relations between individuals and the above-mentioned technological infrastructures of society, namely between immigrants and social media, as a tool for e-participation.

However, according Borkert et al. (2009) to there are three research lines strongly connected with the IIeP project aims, but so far only marginally explored, in gaining a better understanding of the use of technology by immigrants. Namely:

- E-inclusion or policies adopted by governments and institutions in order to reach out to migrant populations fostering immigrants' integration and participation.
- Immigrants' digital literacy, their attitudes, skills and knowledge of ICT, and the use of Internet.

4 E-inclusion and e-participation

Inclusion in the public administrative process in a modern and democratic society may be defined as a process, where others are considered for, invited to and engaged into a joint activity or decision-making. In other words, it means considering other people, making decisions and carrying these out together with them. (Hinsberg; Kübar, 2009, 4).

In this process, from one side there is "the includer", who intends to include others in a chosen activity or decision-making process. Those, who respond to the includer's invitation, may be seen as "the participators" in the inclusive activity. Therefore, inclusion and participation are two sides of the same activity, Hinsberg and Kübar (2009, 11) conclude, adding also, that he greater the impact and more strategic the decision, the greater should be the participation opportunity (same, 15).

The eEurope Advisory Group, co-ordinated by Kaplan (2005) defines the term e-inclusion as follows:

> *e-Inclusion refers to the effective participation of individuals and communities in all dimensions of the knowledge-based society and economy through their access to ICT, made possible by the removal of access and accessibility barriers, and effectively enabled by the willingness and ability to reap social benefits from such access.*

For facilitating effective participation from the authorities' point of view, the following stages of inclusion are outlined by the International Association for Public Participation (IAP2):

Table 2. IAP2 Spectrum for Public Participation Ways for participation (2007)

	Inform	Consult	Involve	Collaborate	Empower
Public participation goal	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly vit the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision-making in the hands of the public.
Example techniques	fact sheets Web sites open houses	Public comment Focus groups Surveys Public meetings	Workshops Deliberate polling	Citizen advisory committees concensus-building Participatory decision-making	Citizen juries ballots delegated decision

Within the current study the term e-participation is representing people's active participation, as well as interacting with the local and nation-wide authorities in decision-making and governance processes, through the use of modern ICT. (European Commission, 2009)

5 Empirical study: design research

Methodologically, this study follows the emerging approach of design-based research, or more specifically: participatory scenario-based design research. Design-based research is a systemic and iterative process, which usually consists of 3-5 cycles. The first cycle of scenario-based design involves design sessions and interviews with the representatives of different target groups and writing the fictional narrative descriptions of 4-5 archetypical users of the system we are about to design. These narratives are called "personas", they help us to identify the background factors, goals and dispositions of different types of users of our future solution. Describing background information and goals of our personas are then used to narrow down the scope of the solution to be designed and to write detailed narrative usage scenarios. Both, personas and scenarios are then validated by the focus group interview with potential users during the next design session.

In our study, we have used personas as means for integrating background information gathered through desk-research on previous research and inclusion policy documents and information collected from two sides of the

participation process: officials from five different state offices, and representatives of four different language and cultural communities in Estonia.

5.1 Persona method

In order to specify the requirements for social media based software system for e-participation, we used the persona method. Calde, Goodwin & Reimann (2002) define personas as "fictional, detailed archetypical characters that represent distinct groupings of behaviours, goals and motivations observed and identified during the research phase". Persona descriptions are used to contextualise the usage scenarios of the software solution to be developed.

In November and December 2010, six semi-structured interviews consisting 15 questions regarding the state office's inclusion practices and principles, were carried out with four inclusion officers of the State Ministries of Estonia and the representative of the State Chancellery, who were all responsible for enhancing inclusion within their organisation and its sub-units. Notes were taken during the interviews, and documented materials available through the web-sites of respective institutions were also analyzed as supporting information in addition to the interviews. In parallel, 4 meetings were held with representatives of different language and cultural communities in Estonia, for receiving an initial overview of the communities.

5.2 Inclusion from the authorities' point of view

From the state officials' point of view the following main reasons for greater inclusion were emphasized:

1. Inclusion is a part of the general public relations management of the ministry.
2. Active inclusion and respective participation help to create more widely accepted legislation.
3. Participating people bring additional information and wider angle on the issues concerned, in the legislative development process.
4. Ministries will receive feed-back on the process of legislative activities and on the draft-documents.
5. Inclusion helps to realize the goals of ministry, as more manpower and resources are brought into the administrative and legislative process.

The interviews revealed the following types of issues, where the input of participating citizens is expected currently:

1. Issues concerning most of the residents, like waste management, usage of natural resources, general education issues.
2. Very specific areas of activities, where expert opinions are needed.
3. Management of competing needs. For example: determining priorities in distributing financial support among theatrical arts NGOs.
4. Spreading information among the members of the wider society.

The interviewed officials mentioned that the inclusion activities are majorly pointed to the pre-existing contacts with experts, target group NGOs or umbrella organizations. In the inclusion process the authorities are looking forward to engage those active and willing residents of Estonia, who hopefully hold the following characteristics and background knowledge:

1. **Enthusiasts in the area of culture, politics, environment etc.** They are deeply concerned about issues or subjects of common public interest. They are participating in the public hearings and events organised for including wider public in opinion forming. They follow the news and developments in the concerned public matter and inform also their fellows and friends about the issues at hand. They are also aware of the global trends in their area of interest, and are able to bring to the discussion new fresh ideas.

2. **Experts on their own specific fields of interest.** They have gained very specific and deep knowledge in their field of interest. They are experts of their field, either by education, or by outstanding practical experience. Their fellow-experts are mostly in other countries, and they are well aware of the current trends and developments internationally. They are able to give comparative evaluations about the developments or situation in their field, internationally.

3. **Active local leaders in their unique society/community, or inter-community activists.** They are active members of their society or non-profit organization. They are among the leaders of the group, and take part in organizing the events and activities of the community. They participate, and also help to organize the country-wide activities for the communities with similar interests across Estonia.

All sought-after types of persons should additionally hold the following skills, or personality traits:

1. Open-mindedness and common good in mind (This person has a sincere desire to advance his interest area, or represent the opinion of other similarly minded persons. He has a positive attitude towards Estonia and believes in the modern democratic views.)

2. Awareness of the local administrative and legal situation (He is aware of or willing to quickly educate himself about the local legislation, national and local plans of development.)

3. Team-work and interpersonal skills (He knows how to negotiate, express his community's opinion and represent their interests in a well-structured way. He believes in good team-work and synergy of multiple minds.)

4. Language and computer skills (He has good communication skills and speaks very good English, or at least good Estonian. He is comfortable with searching for information from the Internet, e-mailing, and using word processing software. Would be good, if he would also hold an Estonian ID-card for digital authentication and signing documents.)

5.3 Initial persona descriptions

Based on the interviews with state officials, and regarding the mentioned expectations towards participating society members, we have described initial four personas (3 as members of a linguistic and cultural minority, one as a representative of the state official) and their goals in relation to our future e-participation solution.

5.3.1 Persona 1: Jeremy

A foreign passport holder from 3rd country, a member of a small minority group.

Age 46. Country of origin: The United States. In Estonia: 5 years.

Occupation: financial consultant at a local branch of an international corporation.

Has lived in several countries in Europe, and Asia, working as a business tax consultant for several international businesses and organizations, within countries of very different economic and administrative systems.

He has moved to Estonia, because of a job offer. He has always been interested in new emerging economies and starting up businesses. Therefore the idea of living in Estonia for a while sounded like a great opportunity. Together with his wife and two children they decided to move to Estonia for next 5 years initially, but now have decided to stay for longer. His kids are attending a local elementary school.

Jeremy understands some Estonian, but mainly learns new words from his kids. After moving to Estonia he had good intentions to take an Estonian language course, but his working schedule did not allow him to take daytime courses, and as he discovered that Estonians often speak very good English, the language learning didn't stay a priority on his agenda. Also, his daily work-life is carried out purely in English. Currently his social circle mostly consists of other American business men in Estonia, and some friends from other nationalities, as well as among Estonians. His kids mainly have Estonian friends through school and American friends through their local American network organized by US Embassy.

Jeremy considers himself as an active internet user. He mostly accesses Internet over smart phone, for business meetings, surfing for information and following international media.

Goals:

Creating better business environment: I find Estonia to be a small enough country where it is possible to rapidly develop business environment and make adjustments to the changing global trends. Every now and then I feel that I could share some good ideas for developing Estonian business environment, and I want to give my share in the development process.

Mission towards the society: I feel that there are several good lessons to learn from other countries I have been living formerly, and I would be glad to contribute to the way things are organized in Estonia, in order to keep Estonia an attractive investment or advanced living place in Europe.

Caring for the future of my children: I sometimes feel that there are issues regarding the Estonian schooling system for kids with foreign background, which could be improved. I would like to have my own children to have a good education and a positive schooling experience, which would also give them an opportunity to continue their studies either in Estonia or any other country we may move to in the future. I would like to give the decision makers an opinion about the education system from the perspective of a foreigner in Estonia.

5.3.2 Persona 2: Andreas

A European Union citizen, a member of a small minority group.

Age: 27. Country of origin: Germany. In Estonia: 3 years.

Occupation: post-doc student at University of Tallinn.

While being a student of sociology at his home university in Germany, Andreas met Anne-Liis, a visiting student from Tallinn, at one of the international student events. They started dating and Andreas started to look for an opportunity to continue his studies in Estonia. A good chance came, when he was granted a post-doc scholarship at Tallinn University.

Andreas and Anne-Liis are nature lovers. On weekends and holidays they like taking bike-rides around Estonia, and other countries. They are both very interested in environmental issues. They recently joined the local club for nature preservation activists. Their club is currently raising awareness on the illegal waste dumping into the forests of Estonia, which became more apparent through the waste collection campaign “Let’s do it! My Estonia” – a few years ago.

Andreas has picked up Estonian language from his girlfriend and university fellows, although his Estonian skills are mainly at spoken level. Nevertheless he is trying to teach himself through reading Estonian newspapers and socializing with his girlfriend’s friends and family members.

Andreas considers himself an active Internet user. He keeps an environmental blog and uses Facebook and Skype daily, to keep in touch with his friends and family back at home.

Goals:

Clean future: I am a real nature lover. I think that Estonia is lucky to have so many beautiful country-sides and much more natural landscape that in the mid-Europe. I would like to help Estonia keep its beautiful nature clean, so that the future generations could also enjoy it.

Somebody needs to do something: When me and Anne-Liis hike or travel around the country side, we often come across horrible waste dumps, which careless people or companies have dropped off into the wild nature. I feel that I need to do something to bring these mindless people into their senses. Together with our nature club we want to participate in all the opportunities, which affect the way people think about waste handling, let it be greater awareness or stricter surveillance against the mistreatment of Estonian nature.

5.3.3 Persona 3: Jekaterina

A 3rd country passport holder, a member of a large cultural minority group.

Age: 52. Country of origin: Ukraine. In Estonia: 11 years.

Occupation: high school teacher of mathematics.

Jekaterina has grown up in Kiev, Ukraine. She is a mathematics teacher by education, but she is also very interested in old national folk songs and traditional musical instruments. She herself enjoys singing and is a member of traditional Ukrainian folk music ensemble of women. Jekaterina met her husband Nikolai, in Ukraine, while he, otherwise living in Tallinn, Estonia, was visiting his relatives in Kiev for his summer vacation. They met at one local musical festival, and found a common language discussing various issues of education and culture. From there on their relationship started to develop, until Nikolai asked her to move to Estonia and to be his wife. After moving to Estonia, Jekaterina found a job at one of the Russian high school, and also joined a local Ukrainian women's society, where she has become one of the active members.

Jekaterina understands basic Estonian, and she can do her daily shopping and run errands. As a person interested in folk music, she would also like to learn to speak Estonian better, but unfortunately her daily circle of friends and co-workers involves mainly Russian and Ukrainian speaking people. She is intending to take up an Estonian language course at some point, because she finds it still be important to know the local language.

Jekaterina considers herself to be a modest computer user. She sometimes writes e-mails to her family in Kiev, and reads Ukrainian on-line newspapers. For her teaching job she also needs to use e-school software and prepare teaching materials for her kids. He finds Internet to be interesting but at the same time a little intimidating, so she feels like she still has much to learn.

Goals:

Keeping in touch with her roots: I have always been interested in my native culture and I am glad to find so many fellow Ukrainians here in Estonia. We would like to keep and develop cultural ties with other Ukrainians in Estonia and also with various cultural organizations back in Ukraine.

Finding supporters for the cultural activities: With the other members of my musical ensemble, we would like to participate at different music festivals in Estonia and also, if possible, in other countries. We are mostly covering all our costs of activities by ourselves, but every now and then we feel, that our local budget is not enough to launch a full concert programme or rent rooms for festivals. I am glad to hear, that Estonian state is supporting various national societies in developing different educational and cultural programmes of minorities in Estonia. Yet, for me as a foreigner, it is often hard to understand the entire bureaucratic process in the project application process. I wish these could be somehow made easier to understand.

Sharing information: I would also like to help my friends in other Ukrainian societies, like our national folk dance group here in Tallinn, and another female vocal ensemble in Narva, to also receive information about the various support opportunities, especially, if we would like to organise a joint concert or similar event.

5.3.4 Persona 4: Mare

A state official, with inclusion responsibilities.

Age 45. Nationality: Estonian. In Estonia: since birth.

Occupation: specialist, Estonian Ministry of Economic Affairs and Communications.

Mare has been working at the Ministry for last 14 years. She is responsible for preparing various legislative drafts concerning strategic development plans in the area of tourism. She believes that inclusion of wider public and experts in the discussion about the possible trends and developments in the tourism area, especially in relation to the purposes of tourism into Estonia is indeed very necessary, in order to give the developments a good direction right from the beginning, and therefore avoid later heated debates at the final stages of the draft law. She has several experiences in including experts, representatives of tourism industry and businesses in

negotiations on last version of the Strategy of Tourism. She is also aware of some political debates on the issue, and therefore she would like to keep the legislative development process of the strategy as open as possible for the wider public opinion, yet make sure that possible misunderstandings would not arise based on too early draft versions and misunderstandings regarding the application process of the Strategy.

Goals:

Good representation of target audiences: I feel that the former expert and partner group has proved to be a well-working advisory body. I would like to continuously make sure, that this advisory body is representing a wide range of different areas of tourism. Ideally somebody, who is representing the opinions of tourists which could be involved in the work-group.

Public support regarding the future directions of tourism in Estonia: Almost everyone nowadays has been in the role of a tourist, either travelling around Estonia or to abroad, for very wide variety of reasons. Therefore I feel that the wide public should also be involved in the discussion on long-term directions of Estonian tourism development.

Timely management: The deadlines given for the development of the new version of the Strategy are not too strict, but still the time needs to be managed well. I am looking for ways to include wider audiences and public in a cost-and time effective manner, hoping to take advantages of Internet communication tools, although I would need some help there.

6 Conclusions

This paper summarised the first phase of an iterative design-based research project. Our interviews with officials resulted with defining four personas as potential users of our social media tools for e-participation. Based on these personas, we have developed six usage scenarios of these tools. The scenarios will be validated and improved during the participatory design sessions with the representatives of target groups. Improved scenarios will serve as guidelines for our software developers, who are going to produce three new social media applications. This persona-defining study and involvement of the future users in software development helps us to address better the needs of the target groups.

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Communities of Practice in Higher Education

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This article tries to describe the possibility of communities of practice in higher education as one study form from Master's student point of view. The description is based on two important characteristic of ongoing learning – communities of practice and interactivity. The article then moves on by stating social media being one interactive option to form communities of practice. Lastly, the possibility of forming communities of practice based on the theoretical analysis of four course structures will be described.

Keywords: communities of practice, interactivity, social media

1 Introduction

While talking about learning at higher level, we tend to equalize it with learning pure theoretical material. For students, acquiring new knowledge simply by working through paper-based materials, is no longer attractive. Wenger (1998a, p. 5) defines learning as a continuing process from social engagement and sees it as a building block of learning system. There for, if we want the students to benefit maximum from the theoretical part, we need to offer the knowledge in new ways. More over, we need to socialize with the audience during the lecture in order to create dialogues, which give instant feedback from the clarity of the subject. In case of higher education, students tend to be mostly the passive participants of the lecture due to two quite important reasons – first, the audience is formed in a way of tens of people listening to the course simultaneously and no real interaction can occur. Secondly, learning has been too isolated and teacher-centered so far, but by introducing ICT tools to learning institution, the paradigm of learning can be changed (Omwenga, p. 1). One cannot forget the technological factor, which at least now is the third participant in the lecture. Learning is social participation supposing the participants' belonging into communities while at the same time, we belong into different communities of practice without even recognizing it (Wenger, 1998b, p. 6). Communities of Practice (CoP) can be defined as joint social entity with mutual engagement inside where the members share communal resources (Wenger, 1998a, p. 2). This article tries to describe if Interactive Media and Knowledge Environments (IMKE) masters' program in Tallinn University is interactive enough to support the formation of CoP as one efficient way for learning process. In order to analyze the curriculum, several course descriptions will be brought out from the point of conducting them.

2 Communities of practice and interactivity in higher education

According to Wenger (1998a, p. 2), in CoP learning start from the very first beginning of the process without the members even recognizing it as learning activity. Instead, they predispose subconsciously the process of ongoing learning by gathering into groups to learn. In their article, Boulous, Maramba and Wheeler (2006, p. 4) claim that students of all ages learn best when immersed within culturally and socially rich environments in which, scaffolding of learning can be achiever. Learning in 21st century is no longer depending on where it takes place, but with whom, therefore we learn more by interacting with others. Effective interaction assumes the people to be more or less familiar with each other in advance by forming communities. To concentrate more on that notion, the explanation of communities being usually not groups, but social networks that are sparsely-knit, loosely-bounded and far-flung would be in order (Hampton, Wellman 2003, p. 3). As said before, pure paper-based course is no longer attractive for the students, but instead they prefer to learn during the process itself and from each other – in other words, CoP could be one way to increase the effectiveness of learning and support lifelong learning. In this context one cannot forget three important factors conducing situation for people with similar values to cooperate – there should be no pressure or limits while making the group; the members should gather on the voluntary basis and most important, the members have to have strong and

personal interest on the subject. If students can take into account, as these factors being the basis of composing different curriculums in universities, then we actually conduce the forming of CoP-s.

The other key component mentioned above is interactivity, as this is the characteristic that makes the subject interesting enough to attract attention. The dilemma rising here lies in the fact of interactivity cannot be unambiguously described. In the context of this article, it is defined as "an attribute of the channel through which communication occurs" (Kiousis, 2002, p. 359). According to Losee (1999, p. 7), communication transfers information; processing of that information takes place in communication systems; both the sender and the receiver are actively involved in a communication system, and the quality of communications varies. What is the most attractive communication system we have now? The answer lies around us in the form of social media (SM). Being able to show its appearance and providing opportunities for usage everywhere, we tend to see SM as an arte fact of everyday life. It has become a tool for socializing and keeping updated with the freshest information about others. Thus, many people equalize SM with entertainment and do not consider it as an alternative tool for learning. SM enables the interested ones to collaborate virtually by providing them with transparent technologies such as wikis, blogs and other open source/ free or low cost software and hosting options (Boulos, Maramba, Wheeler, 2003, p. 4).

3 Searching for evidence

To start with the case study (Fidel, 1984) of IMKE in Tallinn University, some of the courses' descriptions from fall semester 2010 and spring semester 2011, keeping in mind the perspective of interactivity, were looked and described in more detailed. IMKE's program is built up in study sessions allowing the students to combine their studies and work better. Emphasis is in interactivity – in this context, the possibility of getting information online from long distance and communicating via computers, laptops, smart phones etc. Various course descriptions revealed the high usage of different communication tools and social media forms for conducting the activities. Majority of the courses have blogs or Wikiversity instead of paper-based materials. Also students are required to keep personal blog for their studies. Some of the courses have face-to-face meetings, whereas others put a lot of effort into using different communication tools (Skype, FlashMeeting) and study environments (Elgg, EduFeedr). For example, the students could participate in following courses – New Interactive Media (NIE), where study materials will be uploaded in course blog, home works will be presented in students' personal blog, meetings will be conducted via FlashMeeting and every participant could observe his/her personal development in EduFeedr); Ethics and Law in New Media (ELNM) study materials will be uploaded in Wikiversity and discussions will be carried through both in course forum and via weekly Skype meeting, home works will be presented in students' personal blog); Introduction and Theoretical Foundations of New Media (ITFNM) will be carried through weekly face-to-face meetings and any reading materials as well as homework will be shared in Dropbox); Media Project (MP) course will have two face-to-face meetings, all relevant study materials and discussions will be shared in an environment called iCampus (an Elgg-based environment), also two meeting in the middle of the course will be organized using FlashMeeting). This kind of arrangement brings out one big advantage of SM – flexibility. Students have busy lives and important is no longer how much you are able to do, but how much different activities in a short time you are able to do. In other words, how productive you are. Down you can see a short table of the characteristic of above mentioned courses.

Course	Course/personal blog	Wikiversity/Dropbox	Skype/FlashMeeting/forum	Face-to-Face meeting	EduFeedr/Elgg
ITFNM	X	X		X	
MP			X	X	X
NIE	X	X	X		X
ELNM	X	X	X		

Figure 1. Interactivity in IMKE-courses based on course descriptions

In the abstract of this article, the role of technology as the third participant in a lecture was brought out. Analyzing the course descriptions, one cannot leave without notice how technology based program IMKE actually is, although it is expressed more in the form of using SM. Technology is what broadens the range levels of participation and supports community togetherness (Wenger, 2005, p. 14). IMKE-students are widely using modern technology and its applications and therefore acknowledge the necessity of tools being multifunctional. In order to gain maximum, universities need to start supporting the formation of CoP, it should become as an ordinary form of learning or at least one option for the students. Using this logic and describing IMKE, it is a good example of how students are being given the possibility to create their own CoP. As said by Wenger (1998a), "communities of practice do not usually require heavy institutional infrastructures, but their members do need time and space to collaborate" (p. 8). In case of IMKE, CoP is taking place everyday even if the students do not recognize it.

4 Conclusion

In conclusion, this article has tried to describe the concept interactivity and formation of CoP based on the selected courses descriptions of IMKE-program in Tallinn University. The examples show how flexibility and interactivity in the form of SM-tools predispose the appearance of CoP, since the students' needs are put in the center of attention. As long as the university provides the students with suitable learning environment(s), physical appearance is no longer mandatory. The conclusions are based on theoretical analysis of IMKE courses descriptions. There for, the empirical analysis will be conducted and described in future articles that will concentrate more on what is been done in reality.

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