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Adoption of iPads Paving the Way to Changes in the Knowledge Practices within a School of Vocational Teacher Education

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***Abstract*—**The possibilities of mobile technology generate new demands for vocational teacher trainers to transform their approach to work and to incorporate its usage into their ordinary educational practice. This paper presents findings of a focus discussion group (FDG) session on the usage of iPads within a school of vocational teacher education (SoVTE). It aims to clarify how the teacher trainers are using iPads and what has changed in their work during the usage of iPads. The analytical framework bases on content analysis and expansive learning cycle. It was not only found what kind of a role iPads played in their daily practices but it brought also into attention how a cultural change regarding the usage of social media and mobile technology was desperately needed in the whole work community. Thus, the FGD was abducted for developing the knowledge practices of the community of the SoVTE.

***Keywords*—**iPad, mobile learning, vocational teacher education.

I. Introduction

THE context of the study is provided by the HAAGA-HELIA School of Vocational Teacher Education (HH SoVTE), situated in Helsinki, Finland and its teacher trainers. The HH SoVTE has offered traditional ICT tools for teacher trainers. Until recently teacher teachers have only had a PC and traditional mobile phone, but gradually PCs have been substituted by laptops. Earlier smart phones have been available only for teacher trainers who have been working in web-based teacher education program. However, in the beginning of 2013 all teachers will have Lumia 920 of Nokia smartphones. HAAGA-HELIA is in middle of a changing phase. It is moving from the PC world towards mobile world. There have also been projects to utilize social media and smart phones in learning but the projects have been very small-scale.

Some of the teacher trainers at the HH SoVTE are using iPads in their work. However, the HH SoVTE has not provided iPads for all teachers but instead most of the teachers who are using iPads in their guidance and teaching have bought them by themselves. During the last year the interest for wider use of iPads is increased and it has been discussed whether iPads should be available for all teacher trainers.

The paper aims to clarify how the teacher trainers are using iPads in teachers' work at the HH SoVTE, what has changed in the teachers' work during the usage of iPads, and what have been the benefits and challenges in the usage of iPads in guidance and teaching context. We use focus discussion group (FDG) as a method of collecting data. FDGs are understood as less threatening to many research participants, and this environment is helpful for participants to discuss perceptions, ideas, opinions, and thoughts [1]. We shall first provide a brief overview of the recent discussions on changes in vocational teacher trainers' work and iPads before returning to the empirical material.

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II. Changes Taken Place in Vocational Teacher Trainers' Work

The education of vocational teachers requires comprehensive knowledge of the world of work and its changes. Teacher training has been moved from classrooms to work environments where the real challenges involved in the development of education can be met. Teaching and guidance counseling practices have been renewed along the changes in the world of work and research. Much of today's pedagogical infrastructure seems also to be in a transitional state. A conceptualization of a pedagogical infrastructure has been introduced [2]. Pedagogical infrastructure includes social, epistemological, cognitive and technological components for affording and facilitating certain types of learning. All current educational viewpoints and the possibilities of mobile technology generate new demands for vocational teacher trainers as well as for vocational teachers to profoundly transform their approach to work and to incorporate the usage of mobile technology into their ordinary educational practice. This has an effect on vocational teacher trainers' work – as she has to negotiate with herself, her community, with her student teachers and world of work what is important and long-lasting in a world of abundant information, various technological devices and tools [3].

Furthermore, it has been underlined [4] that the utilization of social media in pedagogy requires a change in work cultures within educational institutions. Social media brings along openness, public presence and collaboration that normally have not been part of pedagogical work. It has been maintained this change cannot be fought but embraced with practices that are meaningful in the learning communities.

III. IPAD – A TOOL FOR INDIVIDUAL ORGANIZING A HUB FOR MULTITASKING

Tablet computers have become popular both in free time and work. One of the most popular tablets has been iPad that is designed and marketed by Apple Inc. The first iPad was released in 2010 and the fourth-generation iPad and iPad Mini were released on November 2012. Characteristic for the user interface of iPad is multi-touch screen, virtual keyboard, and sleek profile. It is light and easy to carry while traveling. It is possible to easily download and purchase a huge variety of applications for different purposes. iPads are also personalized tools, meaning that the user can configure an iPad for her own specifications. These reasons have made iPads popular also in learning.

Teachers are reported to seen the potential of teaching with mobile devices, but also noticed the need for learning content on mobile devices [5], for example iPad applications specialized for vocational education are missing. iPads are reported the have several advantages in learning context. The platform is said to be simple, intuitive, and highly usable for home computing tasks such as viewing photos, listening to music, and watching movies [6]. iPads also provides quick and easy access to information for students and it supports collaboration [7]. According to [8], the personalized character of iPads causes that the interaction between the iPad and the student can be more intimate than it is with other tools used only for the learning, such as the calculator.

There is still very little acceptance from old school thinking in using of mobile technology, though things have improved in the last decade [9]. There have been active teachers who have started to use mobile devices in teaching and guiding, but still most part of teachers is not at all using mobile devices at their work. However, the decision is not always made by teachers, but also educational organizations have partly been reluctant to offer devices and possibilities to develop teachers' competencies in using of mobile devices.

Some of the teacher trainers at the HH SoVTE have already recognized the importance of supporting learning via new mobile technological devices and invited their student teachers to try them in their own pedagogical practice. Thus, this has not been systematic but based more or less on an individual teacher trainer's own interests on embedding mobile technology in the vocational teacher education program. We wanted know how those having iPads have used in and possibly introduced its usage to the teacher trainees.

IV. GATHERING THE EMPIRICAL MATERIAL

We sent an e-mail invitation to all vocational teacher trainers to discuss how they use their iPads, what kind of relationship they have built with it, and how it has crept as a tool to their daily professional life. Our aim was to have them to share ideas and opinions of how they originally got interested in iPads, how they have acquired it – whether it was their own or school-owned, and how does assist them in their daily work practices. We also wanted know how iPads had changed their pedagogical approach to teaching and guidance counseling and how they envisioned the role of iPad in vocational teacher education programs in the future.

A focus discussion group (FDG) takes usually place in an informal setting concentrating however on a certain theme. A discussion leader moderates the discussion. One of the central components of a FDG is that there are several participants present simultaneously. According to the constructionist perspective, knowledge creation takes place in social interaction and what is perceived as knowledge, is moulded via certain conditioning factors affecting the interaction. A FGD could be described as an intricate social interaction setting where various power relations, emotions, tensions and social conventions are also present [10].

Only three vocational teachers with their iPads were able to participate the discussion and others having iPads let us know that they could not unfortunately make to the session due other prior engagements. However, it could be said that these three participants well-represented the community of vocational teacher trainers within the HH SoVTE. One of them could be described as a pioneer in iPad and social media having owned her iPad over two years. The other two were iPad novices (the other one had a school-owned iPad and another her own iPad for under six months) – trying to acquaint themselves with iPad in an incremental manner, asking e.g. for assistance from other iPad users like us in informal encounters.

The discussion topics in the FDG were raised by first asking the participants to come up with questions they felt important to the topic of the discussion and then we introduced them our list of themes. The group participants adhered to the topics presented in the session. We provided refreshments and fruit to them in order to make it more relaxed one. The discussion took two hours and was recorded.

We researchers were well aware that certain factors concerning us as inviters must also have had an effect on the knowledge construction: we were known to the others as colleagues well informed in iPhones and iPads as pedagogical tools. We also were the ones who first were given school-owned devices for our experimentations. One also has to be critical on the communicative acts we used - they could have rewarded certain lines of discussion or we could have marginalized some important ones.

As far as the transcription method is concerned, the most important factor was the adequacy of the method to the purposes of this study. The recorded session was transcribed on a topical level and we discussed and analyzed the transcript together and individually.

V. ANALYSING THE DISCUSSION

The methodological discussions about focus group discussion data have slowly begun to underline the importance of analyzing not just the content of what participants express, discuss and negotiate, but also the analytical consequences of the social form of the focus group interaction [11].

Unfortunately due to time constraints we were not able to include this important perspective in our study. We first relied on classical content analysis when analyzing the discussion data. We created smaller chunks of the data, and then placed code with each chunk. After several readings we identified those discussing iPads and its role in their own professional practice were at the same time outlining together a change and learning actions for the whole community of practitioners within the HH SoVTE. This line of discussion (topic thread) was something that was carried out dynamically throughout the whole discussion. We recognized that this topic thread entailed in a small-scale the first typical sequences of epistemic actions of expansive learning cycle [12].

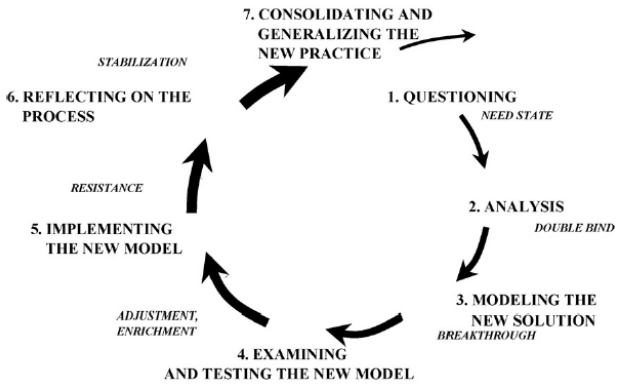

Fig. 1 Sequence of learning actions of expansive learning cycle [12]

The participants seemed to together identify and pave the way to a change needed in the whole community and knowledge practices within it. Therefore we decided to concentrate on this thread and analyze how the participants externalized their concerns of the current situation and outlined the possible solutions.

A. Questioning the Current Practices around iPads

The first epistemic act is of questioning and criticizing the current practice. The participants started the discussion by setting the scene by comparing iPad usage with other pedagogical institutions and positioning iPads within the HH SoVTE context. Examples were shared on how kindergarten children are using iPads and how vocational teachers in normal vocational institutions are using iPads in innovative ways or were given iPads without any pedagogical support. The participants seemed to be worried about the current somewhat negative attitude towards the use of iPads at the HH SoVTE. They held an opposing view, understanding iPads as crucial devices for teachers, and possibly even offering business opportunities for the further education department at the HH SoVTE.

[1]Teacher C *It can be that X institution has done it (using iPads in education) for long, one of my student teacher in hairdressing and make up from Y told me that she has a two week long course in January and all the students will have iPads, and she doesn't know what to do with it […][2]. If others have it (students having iPads), and teachers who get them don't know anything about their pedagogical usage, […] we have arrange soon further education before others will overtake us – for other institutions than schools of vocational teacher education are really active in educating teachers in this area.*

Teacher B *I got this iPad from […] budget, and our IT brought it to me saying that this is your Christmas present and we do not provide any support for it. It cannot be so at the HH that various tools are some sorts of bonuses and we are differentiated by these tools […] It cannot be that a tool is a status question?*

It was suggested that iPads as devices should be available for those interested in using them and others should be encouraged to start experimenting with them. However, the participants felt that no one should be forced to use iPads or similar devices by the management. Own intrinsic motivation was seen important in the adoption of new tools and methods.

Teacher C *If I think about the way I got into using social media in my pedagogical work – I had this kind " a baby begins learn to walk phase" for two years as a private person […] you really need this kind of phase in order to get an idea how to use it personally because only after that you begin see what you can do with it. But if the situation is like ordering from the top down that now you have to use iPads from this day onwards this way in pedagogical work – it does not work that way! The different shades will appear of various apps when you use them – is this good for something or not*? *[…]*

Although the usage of iPads and social media cannot be an obligation, an encouragement to small-scale experimentations should be strongly encouraged by the management.

Teacher B *I think that in my PDD (personal development discussion) there has to be a section where my social media skills are discussed and whether or not there is something that needs to brushed up. This should be done whether I like it or not!*

According to the discussion participants, the HH management should understand the changes taken place in the knowledge society and recognize the need for changes in tools and practices. This involves e.g. documenting the competence requirements in the discussion templates used by managers in personal development discussions. The usage of iPads and

[1] The FGD was in Finnish and translated into English.

[2] […] Some material of the original transcript has been omitted.

social media in pedagogical processes require that relevant devices are made available for everyone. Moreover, there should also be consistent training and support for teachers.

B. Analyzing the Current Situation

The second epistemic act entails analysis of the situation. It involves asking why questions – why have we worked in this way and what are the origins of our work practices. It could also involve discussions on trying to construct a bigger picture of the inner systemic relations.

Teacher B *I get back to this, how do we use these as a community of teachers?*

Teacher C *It is just like in other things – we need rules –*

Teacher B *If I were a coordinator of a team, how far should I go when asking, begging and negotiating with the others – are you willing to work like this – or is it like – we use this in this and this in that, ok, like in the world of work one could imagine. And if I ponder upon the way innovations are diffused – you lot are like first comers obviously and you know your apps and me and teacher A are the lucky ones second comers we do not need to experiment with all the apps – as you see teacher A is writing down which apps work – and then there are those who oppose till the very end.*

Own iPad usage was described on a very personal level – how it was seen to be important to familiarize oneself personally with the iPad first and after that moving gradually to the professional usage in pedagogical practice.

Teacher A *This is always on the kitchen table, to be recharged – I date with my iPad regularly! It is always ready […] I could not have believed a year ago that I would give up reading the paper version of Hesari . I now read Hesari from my iPad and there are lots of nice thing to follow. They are for my own amusement – not for pedagogical use*

Those having more experience shared to the others their favorite apps. The following were mentioned:

Google Maps, Skype, Flipboard, Dropbox, Diigo, Keynote, Mendeley, Slideshare, Vimeo and Wordpress.

Furthermore, experiences of using iPads in pedagogical situation were shared. For example, a teacher had used two iPads and Todaysmeet to allow teams to produce text in a face-to-face session and make the outcomes available also after the session.

It could be noticed that teacher trainers were in different phases in their adoption of iPads. On one hand, they emphasized teacher trainer's autonomy in making individual choices but on the other hand a need for negotiated rules in co-operation were requested. Teacher trainers are working collaboratively in the vocational teacher education programs of the HH SoVTE, thus there should be pre-negotiated rules how to use tools and devices collaboratively.

VI. Modeling the New Idea

The third epistemic act of expansive learning cycle is that of modeling the new found idea that offers a solution to the problematic situation. Having analyzed the situation there was a need to outline and argue the present usage of iPads. Teacher B tried to conceptualize a model for understanding the present situation at the HH SoVTE. Three different dimensions were identified first and then fourth were then added.

Teacher B *I love all kinds of dimensions and I began to think this question of yours and […] and all kinds dimensions and a 2 x 2 matrix, there could be this one dimension there could be this x person to whom this is like a tool similar to a pen, an eraser and a calendar so that administrative tasks could be carried out, it is only for this person's pleasure and she is ok with it. At the other end of this line would be supporting the process, where all the colleagues and my students are involved and it supports all the processes I work with collaboratively with my colleagues and the process I carry out with the my students – this would be like a tool for administration. I wonder whether this really is a 2 x 2 matrix but anyway, the other line would force one to be a better pedagogical actor, to illustrate better the object of teaching […] . The last line entails the idea that it is a tool that requires us to teach its usage to the future pedagogical actors […]*

Teacher B *The first stage would be then that one could use it and we would have a shared calendar, the second stage would be that one can use it like this and the third that one can make material with it and the fourth that I can teach its usage to the others*

Teacher C *Does that also entail the phase that one should also include the idea that one keeps abreast with the times – with one's own professional development?*

After probing the present practices and positioning oneself into the outlined matrix mentally, new ideas were presented how to develop the ways mobile technology is currently used.

Teacher A *[…] if you are forced to do something – that is always utterly obnoxious – what do you think – could there be something in here: if HH, at the management level develops something like this: we could have iPads, Lumias […] or even iPad minis – this kinds of alternatives, and each teacher could choose what she wants, but*

there is no obligation. One can be content with the toy mobile we have …

Others in unison *Can one be?! (laughter)*

Teacher A *Based on voluntarism, all here in our Pasila campus, all us in the same physical space, although it doesn't matter anymore, but it confines a bit this lot, if 30 people choose iPads they would get it for free on the condition that they use it to develop their teaching and all this would be developed via small-scale study further. […]One would really make a study out of this[…]. It could also be within our HH SoVTE […] we could choose what it would be, some research money would be allocated to this in order to get information on how various models work – now this all bases on your personal interests. What I think is important that those who are not that keen on this […] would see what is happening in this area, this could provide some joint trigger us all […]*

During the discussion, the participants seemed to emphasize an approach or a model that the management should have an important role in the beginning of the adoption of tablets and smart phones. They should make the devices available, encourage the use, and allocate money for research to disseminate good practises and models for others to learn from.

VII. Examining the New Idea

The fourth epistemic act involves examining the model and experimenting with it in order to fully understand its dynamics, tensions and limitations. The participants discussed in an animated manner what the approach or model outlined above would require from all those involved in vocational teacher education.

Teacher C *This has to do with the change that is evident – there should be a certain managerial atmosphere where one should not feel defensive on one's whole career if one takes baby steps towards this direction. Of course there are those who feel safe to say that hey, you have a toy like that – and then there are these demarcations of progressive and reactionary - old-fashioned and "I hope that that person would retire soon" types and then those who are active. No one should be the one experiencing that she has to do something that she would not naturally do.*

Adoption of new devices and changes in one's own working practices could be classified as improvements, not a total change of one's own work. However, all change processes are demanding and require time and positive atmosphere to succeed. It is important that an employee has freedom to take the steps on her own speed without pressure from colleagues or management.

Teacher A *[…] One could choose one device, but that is not enough. There should be something for us - not that competent yet - something that will guide us towards the zone of proximal development, so that the small innovations I manage to create would be met with cheer and encouragement! There should be some sort of a support group – I have noticed that people work and develop alone here, I'm not sure if you have noticed that? There could be these kinds of encounters, encouragement and inspiration shared.*

There are wonderful people in our work community but the general atmosphere is somewhat discouraging or do you agree? It is like people walking on the corridors and doing their thing. […] Our curriculum gyms have solved this question in a certain manner, we have been able discuss properly. There has been a certain time allotted to it […] I would like to have similar sessions for this training of devices. Another thing that has already popped up – this(mobile learning and iPads) has to be in the competence criteria of our curriculum. Otherwise this is something that is nonexistent. If it is not there, it doesn't exist!

Earlier, when the adoption of tablets and smart phones has been on an individual experimentation level at the HH SoVTE, the process has been easy, but when we move to the work community level, the situation changes. Change processes normally include tensions and possible misinterpretations. There would also be tensions in this case. The questions raised were whether there should be a high-profile change process launched by the management or only low-profile experimentations among willing individual teachers. It is also asked if there should be an obligation to use iPads or similar tablets or should it happen only on a voluntary basis.

Participants also conversed how to facilitate the adoption process. Questions were raised whether there should be systemic introduction of tablets with various apps in situations similar to curriculum gyms or only social media-based tips of apps recommendations on a weekly basis. It was also discussed if instead of only individual experimentations, collective and research-based adoption of various tablets could produce enthusiasm and joy for learning something new.

It is important to identify possible tensions in a change process, so that they can be conversed, solved and practices defined.

The last two epistemic acts entail implementing the model and reflecting and evaluating the process. As we only discussed the current situation and outlined the possible future actions the last epistemic acts of expansive learning cycle [12] were not naturally realized. Some questions were raised of what we as researcher are going to do with material and how the suggestions of giving e.g. tips of good apps will proceed.

VIII. Conclusions and Avenues for Further Research

Our original goal of this paper was to study how vocational teacher trainers working at the HH SoVTE have as individuals adopted iPad to their professional practice. We did not only found out during our FDG what kind of a role it played in their daily practice but also how it was emphasized how a cultural change regarding the usage of social media and mobile technology were desperately needed in the whole work community. Thus, the FGD was abducted for developing the knowledge practices of the community of the HH SoVTE. We understand that this discussion was only a brief session for probing the current practices and elaborating the possible new futures but it in an interesting way revealed the pressing need for a change to happen.

iPad is still seen as an individual tool for an individual teacher trainer – to be properly used as a learning hub requires knowledge practices shared with the community. Collectively cultivated knowledge practices are understood as social practices related to working with knowledge i.e. personal, collaborative, and institutional routines [13]. In order to change our ways of learning at work together with our student teachers we need to transform our knowledge practices – mobile technology provides structures for that. Moreover, mobile technology should be understood as a catalyst and an enabler, not a solution itself.

The involvement of management varies in the knowledge practices process. To achieve novel knowledge practices in the institutional routines in the HH SoVTE it was recognized that top management should be actively included in the process with a strong support from the IT department. The management also should have visionary ideas about the future. On the other hand it was felt that personal routines could be developed much better if the process takes place at a grassroots level without involvement of management and its restricting rules. But in order to change collaborative routines and to get all the colleagues included into the process, the role of management were seen important again. To sum up, when we move inside the knowledge practices from professional development via collaborative development towards institutional development, the role of management increases gradually and is the highest in the institutional development level.

It was seen important that the whole community of the HH SoVTE should be integrated in general mobile learning technology and in particular to the iPad knowledge practices. At the same time, it was noticed that each community member should have enough time to familiarize herself with the iPads and proceed on one's own pace in the usage of iPads. On the personal development level, an employee should have enough freedom and time, but to pave the move towards the professional and collaborative level some kind of peer-support or mentoring was seen extremely important. Also sharing of knowledge, experiences and good practices was seen vital, so that those who are interested in the usage of iPads will not get frustrated by trying to learn alone, but instead get new ideas from the more experienced iPad users.

Future research can include two paths. First, it would be important to follow, how the knowledge practices evolve in the three levels: personal, collaborative, and institutional and what the main components of success in each level are. Second, our original research question, how vocational teacher trainers working at the HH SoVTE have adopted iPad to their professional practice, should be studied in more detailed. An interesting question would then be how their knowledge practices have changed after having been using iPads for a longer period.

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