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Using Mobile Tools to Support Meaningful Work-based Learning in Vocational Education

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Abstract

This case study focused on meaningful work-based learning (WBL) and the pedagogical use of mobile information and communication technologies (ICTs) in vocational tourism education. The aim was to reveal how teaching/tutoring and learning are realized and how the use of smartphones supports the realization of meaningful learning characteristics during WBL periods in highly versatile environments. Within a design-based research framework, the data was collected through learning journals written by students and qualitative interviews. The results of thematic analysis were used to develop a practice-oriented pedagogical model for meaningful WBL. The model visualizes the roles of students, teachers, and companies involved in WBL, the meaningful learning characteristics that can be amplified through the use of mobile ICTs, and the outcomes for each stakeholder. The model suggests structuring WBL through four negotiations involving a student, a teacher, and a company to assure that each student has clearly formulated learning goals and possibilities to pursue those goals regardless of the mobility of their work or facilities during their WBL period.

Keywords*:* work-based learning, mobile learning, pedagogical models, design-based research, vocational education

Introduction

Lately, vocational education and training (VET) in Finland has strived to strengthen student centeredness and connections with working life, enhancing the role of work-based learning (WBL) (Finnish National Board of Education,

2016). Within the legislative structures, vocational institutions are free to determine the practicalities of the education they provide. The Vocational College of Eastern Lapland (VCEL) conducted a decentralization experiment where the tourism education program was physically moved from the main campus to a ski resort about 40 km away from the main institution, which fits well the 120 ECTS-wide educational program. It provides future tourism professionals with an authentic learning environment and tightens their collaboration with local tourism companies. Living at the ski resort every day allows students to participate in organizing local events, strengthen their understanding of local tourism business, and begin building professional networks.

Pedagogically, the focus of the developmental work was on WBL periods that are an inseparable part of VET and cover at least 30 ECTS of educational programmes. School-based learning cannot substitute for the experiences students gain through learning while working full-time at a company for a few weeks at a time; becoming a professional requires learning how to learn at, for, and through work (Evans, 2011). During WBL, work-related contents studied at school are used in a practical setting. The college needed a pedagogical model that would support the organization of the WBL periods, enhance the meaningfulness of WBL, and afford mobile learning practices during WBL. Here, mobility in mobile learning is understood as a phenomenon characterized through five aspects: physical, technological, social, conceptual, and temporal (Sharples, Arnedillo-Sanchéz, Milrad, & Vavoula, 2009). Learning for tourism students, in VCEL and during WBL, is often scattered as they may shift places and spaces (physical mobility) several times a day from a classroom/office to a hiking trail. During the first cycle of this design-based research (DBR) project, for some students, the location of their WBL was such that they had difficulties in completing their school assignments due to the lack of Internet connections (Vuojärvi, Eriksson, & Ruokamo, 2012). Neither did any of the students have a smartphone of their own, which could have at least partly resolved this problem. Therefore, the mobility of technology allows flexibility for students in terms of when and where they study, bridging contexts and contents. Students also encounter different kinds of people (customers, entrepreneurs, etc.) requiring different styles of interaction (social mobility) and various kinds of knowledge to manage in these situations (mobility in conceptual space). In Vuojärvi et al. (2012), students also indicated that their workdays included a significant amount of idle time that could be used for school related work if equipped with suitable mobile tools. Therefore, mobility of technology may also help to disperse learning in time (Sharples et al., 2009). Overall, students had very positive expectations regarding the use of educational technologies (Eriksson, 2012), which was a positive starting point for the next research cycle with smartphones.

Affording students the possibility of engaging in mobile learning during WBL was considered important as mobility is highlighted in the context of tourism work in Lapland. Tourism jobs are usually based in small companies where one person is often responsible for a wide array of tasks, from marketing to taking customers on rafting trips. Simultaneously, they are required to follow the trends in the tourism industry and continuously update their knowledge and skills. During WBL periods, tourism students face both the conceptual and the practical understanding of mobility. Therefore, the desire of the college to develop its WBL pedagogy and explore possibilities for mobile learning seemed justified.

This article presents a qualitative case study conducted at the VCEL. The aim was to reveal students' perspectives regarding how mobile ICTs—in this case, smartphones—can support meaningful WBL. A meaningful learning framework rooted in the works of Ausubel (1968) and Ausubel, Novak, and Hanesian, (1978) understands learning as a process during which new information is integrated into what the learner already knows. It views

learning through a set of characteristics that have evolved over time from cognitive to more socio-constructivist (Jonassen, 1995) and socio-cultural directions, embracing also the cultural, social, and historical contexts of teaching and learning. The framework was considered to be dynamic and broad enough to thoroughly describe WBL while enabling the consideration of the various settings in which students work and learn.

Research literature reports diverse compositions of meaningful learning characteristics applied in various ICT-rich educational contexts in which studies aim to find out, for example, the weight of each characteristic and/or students' expectations and perceptions of meaningful learning in certain pedagogical contexts (Jonassen, 1995; Poikela & Vuojärvi, 2016; Ruokamo, Tuovinen, Tella, Vahtivuori, & Tissari, 2002). The meaningful learning framework has also served as the basis for practice-oriented pedagogical models for various educational purposes (e.g., Hakkarainen & Vapalahti, 2011; Keskitalo, 2015). Similar characterizations of learning in the VET context can be found in the study by de Bruijn and Leeman (2011), who designed a model of powerful learning environments to combine authentic and self-directed learning in VET to support the development of students' vocational identities. This model was, however, not designed for WBL, but for finding ways to make the contents and practices of school-based VET more oriented towards working-life.

The data for this study was gathered through students' blogs and interviews, and the information gained through qualitative thematic analysis (Gray, 2004) was used to develop a pedagogical model for meaningful WBL. Designing a research-based pedagogical model was considered important because pedagogical models can diminish contextual differences between students and help in assuring that students have similar support and opportunities for WBL (Tynjälä. 2013).

This study was a part of the design-based research (DBR) activities of the TravEd research project (Brown, 1992; Design-Based Research Collective, 2003). The initial pedagogical model was published earlier in an article by Vuojärvi et al. (2012). Its design was based on results gained from two pilots of the first DBR cycle of design, implementation and analysis (Figure 1).

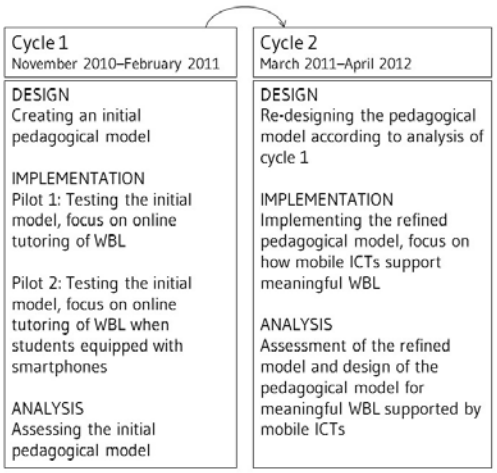

Figure 1. Development of the pedagogical model through cycles of DBR

This paper continues the DBR process with another cycle that focuses on the use of mobile ICTs to support meaningful WBL in vocational education. The

following sections present the pedagogical underpinnings, data collection and analysis, and the results of the study.

Developing the Pedagogical Model

Pedagogical Premises

Research literature provides some examples of pedagogical models for VET and WBL. Raelin (1997) conceptualizes a model of WBL that combines explicit and tacit forms of knowledge with theory and practice modes of learning. The significance of the students' own reflections is emphasized in the model, and it is considered important to articulate the tacit knowledge that many workplace practices are based on, but that are rarely expressed or negotiated. Eraut (2004) provides an analytical framework that focuses on factors that affect learning in the workplace. He identified both learning factors (confidence, support, and challenge) and context factors (allocation of work, relationships at work, and expectations of performance); the significance of these factors and the ways they interact differ greatly from one context to another.

What is found problematic in both frameworks is that they leave the role of a workplace instructor somewhat vague with plenty of variety in instructors' duties and how deeply they work with students. Eraut (2004) addresses this same issue and recommends educating company managers for the role of facilitating learning at the workplace. In a later work by Virtanen, Tynjälä, and Eteläpelto (2014), integration between school learning and workplace learning is considered crucial. Collaboration between teachers and workplace instructors can result in increased learning outcomes and strengthened vocational identity for students (Virtanen, Tynjälä, & Stenström, 2008). Promoting active roles for students in the workplace is suggested as is paying attention in the design of WBL periods in terms of integrating classroom-based learning and WBL.

Recently, the affordances of the pedagogical use of mobile ICTs have been explored to address these issues in WBL contexts. Mobile phones and e-portfolios have been used, for example, to construct narratives of the development of students' vocational identities (Chan, 2011) and to negotiate the knowledge between students and institutions (Wallace, 2011). However, technologies alone will not explain students' WBL outcomes; the key factors seem to be systematic goal setting, guidance, and assessment. Also, social and structural features of the workplace, educational practices, and student-related individual factors are crucial (Virtanen et al., 2014). Even though students are at the heart of WBL practices, the roles of teachers and workplace instructors are equally important.

We believe that the role of teachers and workplace instructors could be enhanced through envisioning the outcomes of WBL from their perspective. Learning outcomes for students are usually portrayed, but a proper visualization of all the outcomes, including all stakeholders, could help to motivate the pedagogical practices and change the view, too common in small-medium size companies, of students as nothing more than free labour for the companies (see, e.g., Cornford & Gunn, 1998 and references therein).

We identified a need for a practice-oriented pedagogical model that would provide guidelines for how the WBL period should be carried out. The structure of our pedagogical model follows the work of Joyce and Weil (1980), considering the pedagogical model as a general pedagogical plan that can be used to develop curriculums, design instructional material, and guide teachers and workplace instructors in their work before, during, and after students' WBL periods. Reflective elements were included to connect school learning and workplace learning and to develop students' boundary crossing skills, such

as the ability to work and apply knowledge in changing contexts (Guile & Griffiths, 2001; Virtanen et al., 2014).

Pedagogical Development through Design-based Research

The development of the pedagogical model for meaningful WBL has followed the guidelines set by the principles of DBR aiming to develop both educational practices and theoretical constructs through repeated cycles of design, implementation, and analysis (Brown, 1992; DBR Collective, 2003). DBR's intrinsic character is the tight connection between theory and practice, which can be seen in that all activities in DBR studies are based on tight collaboration between researchers and practitioners (Barab & Squire, 2004; Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Wang & Hannafin, 2005). In our case, teachers and tourism students worked closely with us providing essential information and sharing experiences from their daily lives.

The tight connection between research and practice reflects the dual goal of DBR. First, it aims to produce new theories, artefacts, and practices that may have an impact on learning (Collins, Joseph, & Bielaczyc, 2004; Edelson, 2002). Second, it unfolds theories for assessment and examines the changes they suggest on a local level. In our study, this meant considering how students saw mobile ICTs supporting meaningful WBL, how their learning processes were realized, and how our initial pedagogical model should be developed on the basis of students' perceptions. Students participated in the process as co-designers by making their thoughts and perceptions explicit through blogs and interviews. The role of the student has been significant in the development of the pedagogical model. This dual goal brings DBR very close to the kind of learning that takes place in real-life, naturalistic settings (Barab & Squire, 2004), such as the tourism companies in this study.

The first DBR cycle yielded an initial pedagogical model for meaningful WBL (Vuojärvi et al., 2012) in which WBL is described through nine meaningful learning characteristics that covered the context of decentralized tourism education. These characteristics 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 and authentic, (7) reflective and critical, (8) creative, and (9) emotionally involved. The first DBR cycle indicated that students might benefit from using smartphones during WBL as they would provide the missing Internet connections for their laptops and a tool to engage in learning activities during their sporadic free time. Smartphones would also enable students to use a variety of media to gather material for the learning diaries that they were expected to keep during WBL periods and promote communication and collaboration in and across ever-changing contexts (Vuojärvi et al., 2012). Overall, the use of smartphones could support the perceived meaningfulness of WBL.

Our presumptions were supported by a case study conducted by Douch, Savill-Smith, Parker, and Attewell (2010) that reported several benefits of implementing mobile ICTs into WBL. Pimmer and Pachler (2014, p. 193) conclude that mobile devices enable users to "connect and span different situations and forms of learning and, accordingly, support learners across various contexts and phases of their career trajectories". In the best case scenario, mobile ICTs engage students with learning, allow for greater flexibility and personalization, provide access to learning resources, enable fluent communication and collaboration, strengthen their sense of belonging to a learning community, and even support learner retention and achievement.

During this DBR cycle, our aims were twofold. First, we wanted to find out how the use of smartphones during WBL would affect the realization of the

meaningful learning characteristics. The second objective was to develop the pedagogical model further so that it would better describe the processes involved and provide more detailed instructions for the implementation of WBL periods for each stakeholder. The research questions of this study were:
1) How were teaching/tutoring and learning realized during the WBL period according to the participating tourism students?
2) How did the use of smartphones support the realization of meaningful learning characteristics during WBL periods according to the students?
3) What implications do the students´ perceptions have on the pedagogical model for meaningful WBL that is developed during DBR cycles of this study?

Research Design

The data were collected throughout a 15-month period beginning in March 2011 and continuing until May 2012 and included two WBL periods. Students were provided with smartphones and user training before their WBL started. Training covered the basics of the particular smartphone, time management, communication, and social media applications use (e.g., calendar, email, Twitter, WordPress). They were also free to use their own smartphone instead. Textual data consists of students' online learning diaries (N=14) written during WBL periods on WordPress blogs. Students were asked to describe their tasks and duties at work and reflect on their learning and whether they had succeeded in achieving their learning goals. Through the blogs, the teacher was able to keep track of their work and development, comment on their reflections, give guidance, and otherwise communicate with individual students. Based on an assumption that limited access and familiar readers would encourage the more cautious students to share their thoughts, experiences, and emotions, the students were first advised to keep their blogs private so that only the teacher and the two researchers would have access to them. Later, however, we suggested that students provide access to their workplace instructors, but only one student made this change.

Students were interviewed twice (N=9 and 12) during the data collection period. The interviews took place at Pyhä ski resort in a quiet negotiation room in the hotel. Researchers met the students after their WBL periods had ended and they had returned to school. The interviews were conducted individually using a prepared list of common themes to be covered in the interview (i.e., students' experiences during WBL and their experiences and perceptions of using smartphones during learning and free time). Interviews were recorded and lasted for 20-40 minutes each. Students were asked for informed consent for the researchers to read their diaries, conduct interviews, and use the collected material as research data.

The data was analysed using qualitative thematic analysis (Gray, 2014). We worked theory-driven and aimed to identify and analyse notions of meaningful learning characteristics and students' perceptions of their learning processes during WBL in our data. We aimed to strengthen the reliability of the analysis through tight collaboration and interaction during analysis. In practice, we first transcribed the interviews into textual form. This was followed by focused reading of the interviews and blogs and coding the data. Codes were amended through repeated readings and collated into themes that described how mobile tools supported meaningful WBL and how students' learning was realized. These themes were used in re-designing the pedagogical model for meaningful WBL supported by mobile ICTs. The results and the model are presented in detail in following section.

Results

Students' Perceptions of Teaching and Learning on WBL Period

Teaching and tutoring

Students seem to have a very practice-oriented view of learning during the WBL period. We identified a few critical aspects that should be considered when organizing WBL with companies. First, students' preparation practices for WBL were not uniform. Some were well familiarized with their work places beforehand. For instance, one student said, "After the visit I feel that I am going there to learn, not as free workforce. That's really nice, because before I have felt more as workforce [in the past]" (Student 4). In most cases, however, students began their WBL periods simultaneously during the busiest tourism season. This resulted in inadequate tutoring and facing authentic work tasks with customers without even knowing their work mates or the practices of the workplace. In some cases, inadequate tutoring resulted in poor customer service and negative feedback from customers:

> I was totally lost and it was "great" [terrible] to start at the new place in such a hurry. Luckily [Student 8] worked at the same place and was my personal guide. . . I don't mean that she wasn't able to guide and advise me, but I felt that it wasn't her job, but that someone who actually worked there should have briefed me about the practicalities. (Student 2)

Second, the data indicates that not all companies providing WBL positions were up to date with their instructional responsibilities. This is evident as almost all students, at some point in their WBL periods, indicated that they were not learning anything new. These problems arose partly because students worked in the same companies period after period. The selection of workplace instructors should also be considered carefully. Not all workplace instructors worked with students. As one student said, "I haven't learned anything new, and I haven't seen [the workplace instructor] so I haven't been able to discuss any additional projects" (Student 13).

Some individual cases yielded useful development ideas for the pedagogical model. For example, one student had a development discussion with his workplace instructor at the end of a WBL period, and in that discussion, they identified some learning goals for future WBL periods.

Studying. National qualification for VET in Finland requires students to set learning goals for each WBL period (Finnish National Board of Education, 2016). In our case, students were also expected to write a learning blog where the learning goals were stated and reflected upon during and after the WBL periods. Overall, the students considered WBL periods as the most important experiences in their learning, and it is, therefore, interesting that they perceived setting learning goals for themselves so difficult. During WBL periods in the spring 2011, only half of the students actually defined their learning goals, and those who did, presented them in a very general nature. Their reasons for not setting their goals were, for example, that they were not sure what kind of tasks they would do during WBL or whether they were going to work at the same place as the previous period and, therefore, perceived it unnecessary to set new goals. When asked if goals had been set, one student replied, "No not really—all of the apprenticeship periods were so alike. I didn't have any [goals] for these last [WBL periods]" (Student 11).

Ignoring or not setting learning goals seemed to be common, particularly to those students who perceived writing a learning journal to be a meaningless task. Students, who were able to see the connection between different pedagogical elements of their WBL periods (i.e., setting learning goals, writing a learning journal, receiving and giving feedback, and assessing their own learning) seemed to be most competent in acknowledging their previous skills and knowledge, setting their learning goals in relation to them, and reflecting on their progression. One student commented, "[The WBL period made it possible to reach my learning goals] very well as I got to take care of those more responsible tasks and got to do things more by myself" (Student 14).

An interesting detail was that students who were unsuccessful in setting their learning goals did not feel that they would have needed more guidance from the teacher either. It may be that they did not quite understand the idea of a WBL as a learning period with certain learning goals and considered it merely as a period of time spent working at a tourism company.

Supporting meaningful learning characteristics with smartphones

For the initial pedagogical model (Vuojärvi et al., 2012), we formulated nine meaningful learning characteristics of a WBL. In this study, our interest was to determine how the use of smartphones supported the realization of these characteristics during WBL from the student's perspective.

In the analysis, we identified six characteristics on which the use of smartphones seemed to have an impact (see Table 1), and we also adjusted the composition of some characteristics. In the initial model "collaborative and conversational", "experiential and authentic", and "reflective and critical" were grouped into individual characteristics, but here we had to split them again into separate characteristics; "conversational", "experiential", and "reflective" appeared in the data, but "collaborative", "authentic", and "critical" did not.

Table 1 shows the results. Each characteristic is explained briefly and accompanied by an example from the data.

Characteristic	Definition	Example from Data
Active and self-directed	Students actively engage in planning, implementing, and evaluating their learning processes utilizing a variety of tools (e.g., Jonassen, 1995; Ruokamo, et al., 2002).	I was wondering if I could do something extra along with my work, a little project or something...(Student 13). [...] I was able to draft some ideas [in the blog] and re-write them in the evening (Student 4).
Individual and goal-oriented	Learners have individual learning strategies and the choices they make regarding goal-setting, learning, and working are affected by their prior knowledge, conceptions, interests, and motivation (e.g., Ruokamo et al., 2002).	Mostly I gained from WBL periods, as I reflected on my own learning (blog, although a bit rarely at times) and planned my learning goals (Student 14).
Conversational	Learning is dialogical, entailing both internal and social negotiations (e.g., Jonassen, 1995).	Things were quite clear there, so if there was something unclear it was just easy to phone. I guess I talked a lot on the phone during that week in particular (Student 10).
Experiential	Learning is based on students' practical experiences, which they can use throughout their learning process. "Experiences" are understood here as students' prior practical knowledge and as the aim of learning (e.g., Kolb, 2015).	Here are some pictures from my WBL period [pictures displaying a table setting]. I got to do the table setting all by myself twice. [...] It was a busy day, I remember it clearly (Student 7).
Reflective	Learning is a process where students express what they have learned and contemplate their thinking processes involved in learning situations (e.g., Jonassen, 1995).	Through my blog I realized I achieved one of my goals [...] I was learning the whole time, but didn't really think about it. Now as I started to write after that week, I realized how much I had learned (Student 5).
Creative	Creativity emerges in the ways students manage unpredictable	Working as a guide, I used a dictionary [through smartphone] quite a lot and

	situations, find ways to improve their performance, or make connections between concepts previously regarded as unrelated or even contradictory (e.g., Novak, 1998).	then one could show pictures [from the Internet] if someone had, for example, found some animal tracks—then I could show a picture of the animal—what it looks like and so on (Student 14).

Table 1: The Use of Smartphones Supporting Meaningful Learning Characteristics during WBL

In general, students were active learners during their WBL; however, the weight was more on evaluating ways of doing things than evaluating information or the ways it was applied in practice, which reflects the practice-oriented nature of VET. Being active and self-directed seems to be intertwined with the characteristics of goal-oriented and reflective. The mobility of devices is not a necessity to implement active and self-directed learning, but it seems to make it easier to handle different situations, get down to study when there is an opportunity, and follow the plans and timetables set by the learner. These results are supported by those of Vogel, Kennedy and Kwok (2009), who claimed that to engage and sustain students to apply mobile devices in learning, they should have an appreciation of deep learning as well as time management skills.

Students had their own priorities and higher-level goals that they aimed for, and they approached WBL accordingly. The goal of some students was to start their own businesses in the future, and some used this VET as a starting point for future studies. These factors affected students' motivations, and consequently, their activities both at work and, for example, in reflecting on their learning during and after the WBL periods. The same seems to apply to using mobile devices during WBL. Smartphones provided a tool for students to reflect on their learning when on the move, during short breaks, and even when outdoors if their workplace allowed them to use their smartphones during work hours. Students accessed their blogs either by smartphone, desktop, or a laptop, depending on the possibility of using smartphones at work, the availability of network connections, and whether they were working inside or outside. Especially students who worked outdoors found some innovative ways to use their smartphones. Creativity in tourism work seems to be related to finding ways to manage different, and often unpredictable, situations with customers. Smartphones may help to find information or solutions needed to manage these situations even in the wilderness. A creative person can use mobile ICTs to provide services for customers that would not otherwise, with reasonable effort, be possible.

Some students found blogging natural, and it was easy for them to write about their activities, thoughts, and reflections. However, some of them had problems motivating themselves to give thought to their learning, and it took much effort for them to get started. One student completely ignored writing a learning journal regardless of the personal advice and tutoring she received by email and face-to-face. One reason for difficulty in writing a learning journal was that students reported working long hours, which is typical for tourism industry during high seasons (Vuojärvi et al., 2012). Long working days were not perceived as a negative experience—quite the contrary—but students reported that they were so tired after the long work days that they did not have the energy to update their blogs.

The meaningful learning characteristics that were not present in students' descriptions of using smartphones during WBL were (a) constructive, (b) contextual, situational, and multiple-perspectives oriented, (c) authentic, (d) emotionally involved, (e) critical, and (f) collaborative. It seems logical that smartphones did not support collaborative learning during WBL, as students are novices in tourism. In the novice phase, WBL is quite individual in nature, and the focus is on the completion of tasks (Virtanen et al., 2014). Also, being a

trainee in a working community, it may be that other members of the community do not share the same kind of learning orientation along with work. Therefore, the practices in the workplace do not support collaborative learning (Dillenbourg, 1999). "Critical" means being critical towards theoretical knowledge (Cottrell, 2005), which is perhaps not that relevant in WBL and consequently, does not appear in the data. The characteristics of "contextual, situational, and multiple-perspectives oriented" and "authentic" are such in nature that it seems hard to enhance them through the use of mobile ICTs. Smartphones might help the implementation of many tasks, but they will not make any of the tasks "more authentic".

It would be possible, however, to make WBL more "emotionally involved" and "constructive". More frequent blogging and systematic reflection upon one's own learning might help students in developing metacognitive skills and setting learning goals (Burleson, 2005). Learning improvements may be difficult for students who are unaware of their shortcomings (Kao, Lin, & Sun, 2008). Visualizing learning processes through various media in a blog could also bring about feelings of joy and achievement.

Implications on the Pedagogical Model

Our results indicate that the implementation of WBL could be developed further by structuring interaction between the stakeholders before, during, and after WBL periods into negotiation cycles, following the idea of development discussions that are carried out annually in real-world working life. This would sharpen students' active roles in learning, strengthen their experiences of being responsible of their learning, and help focus all teaching, tutoring, and learning activities on pursuing students' learning goals. The pedagogical model for meaningful WBL is presented in Figure 2.

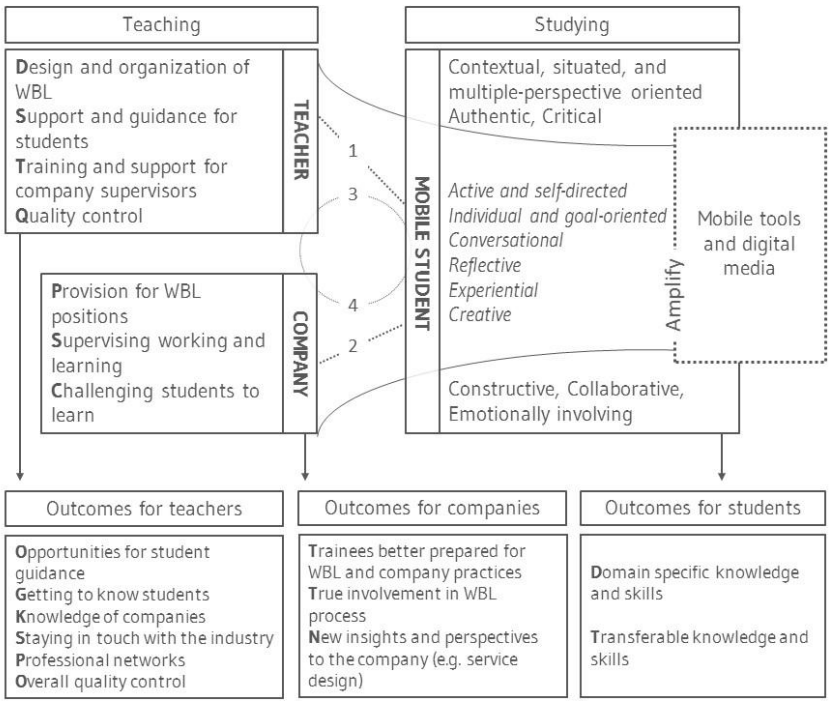

Figure 2. The pedagogical model for meaningful WBL supported by mobile ICTs.

First cycle. The negotiation process during the WBL period takes place in the four cycles identified in Figure 2 by dashed line and numbers 1–4. Before each WBL period, students are required to define learning goals, which depend on the main theme of the period and the personal objectives they consider important. Students negotiate regarding goals with their teachers to reach a mutual understanding of the theme of the WBL period, skills, and knowledge

the student aims to learn, and possible companies where those goals could be pursued. This is part of constructing common grounds, since actions (working) cannot be interpreted without referring to students' learning goals, and reciprocally, goal discrepancies are often revealed through disagreements on action (Baker, Hansen, Joiner, & Traum, 1999). Without mutual understanding of the student's learning goals and tasks during WBL, learning results will be sporadic or even non-existent. Our study supports the understanding that goal-setting must be systematic (Virtanen et al., 2014); otherwise, the student just might or might not learn something valuable for their development as a tourism professional.

*Second cycle***.** Next, a student negotiates with a workplace instructor regarding a job description that would help in pursuing the learning goals. This reflects earlier empirical knowledge of the importance of having strong connections between school and workplace to support students' learning (Virtanen et al., 2008, 2014). Agreeing about working hours and breaks during a workday would provide possibilities to study even during the high season when trainees' workdays may last up to thirteen hours. Although it is important that students confront the authentic everyday life at the company they are working for, the work should enable students to complete assigned learning tasks.

We also suggest that students and their workplace instructors reserve time for an orientation period to discuss ongoing duties and to get acquainted with their instructors, work mates, work culture, and the physical working environment. Students' reflections in their learning diaries indicate that low-paced orientation would provide students with positive experiences of the workplace right from the start.

Third cycle. The third negotiation includes an interactive re-evaluation of learning goals and the restructuring of the student's job description for the rest of the WBL period if needed. This supports the development of the student's skills and knowledge throughout the training period and helps the instructor challenge students at work.

Fourth cycle. The final cycle is feedback. An official assessment of WBL is carried out during WBL periods and is based entirely on competence-based qualifications defined by a set of skills and knowledge that a student should master and present to pass the WBL. This evaluation is, however, one-directional, and we suggest that additionally, the student, the teacher, and the workplace instructor participate in a feedback discussion. Students get feedback about how they worked and thrived in the realization of their learning goals. The teacher, company, and the workplace instructor get feedback about guidance and a possibility to develop their practices before, during, and after WBL periods. It is important that students also reflect on their learning goals by themselves and evaluate how their own activity played a role in achieving them.

Mobile ICTs and Digital Tools in WBL

This qualitative case study revealed that mobile ICTs can amplify some meaningful learning characteristics during WBL (Figure 1). The pedagogical use of mobile ICTs can provide support for combining school learning with WBL periods, but taking advantage of mobile ICTs in learning requires self-regulated and motivated students who are willing to put some effort into their learning.

Pimmer and Pachler (2014) show the diverse possibilities mobile tools provide for the connection of situated, socio-cognitive, cultural, multimodal, and constructivist learning perspectives in WBL. In their view, mobility of devices "enable cross-contextual learning by bridging and connecting" Pimmer &

Pachler, 2014, p. 199). Mobile devices provide tools for fluent creation and sharing of digital materials as it is easy to, e.g., capture videos to document one's learning experiences (e.g., Brandt, Hillgren, & Björgvinsson, 2005), reflect on them in a blog post, and later discuss these pictures and reflections in formal settings like classrooms with teacher and peers, bridging learning in formal and informal settings (Pimmer & Pachler, 2014). Mobile devices are ideal for just-in-time learning that usually takes place at work by being immediately relevant for learners (Harris, Willis, Simons, & Collins, 2001). In the tourism context, this is essential when tackling immediate work challenges, for example, while acquiring information for customers outdoors. Mobile devices naturally enable communication through several channels, but also individual and social forms of learning such as social networking and creation of work-related professional networks becomes easily available (Pimmer & Pachler, 2014).

Face-to-face negotiations before and during the WBL period are important and should not be overlooked, but for students, it is also very important to have time to consider, re-evaluate, and revise their learning goals as well as to reflect on their learning experience and digest the received feedback in peace. Time in face-to-face negotiations is usually limited, finding common time suitable for all the participants can be hard, and if the companies providing the WBL environments are geographically distributed, which often is the case, then the distance can also be challenging. Using digital media together with mobile ICTs to deal with the negotiation cycles is a way to bring both flexibility and efficiency to the process. Blogs are functional for sharing thoughts, reflections, and feedback (cycles 3 and 4; e.g., Comas-Quinn, Mardomingo, & Valentine, 2009). Instead, discussion-forum kinds of media might be applicable for the period of time when students present their learning goals and try to find the most suitable company to provide the best environment and work tasks that help to realize those goals (cycles 1 and 2). Grace and O'Neil (2014) introduced one example of an online tool to help with getting ready for work-based learning in health education. The tool, for example, provides students a forum to get to know one another, helps students to set their learning goals, and negotiate learning contracts among students, supervisors, and clinical placement coordinators.

Outcomes for Students, Teachers, and Companies

Following the original idea of a pedagogical model (Joyce & Weil, 1980), students are expected to gain domain-specific and generic knowledge and skills. In this study, domain-specific knowledge included local knowledge of the tourist destinations, customer-service skills, the production of tourism services, and knowledge about different kinds of equipment needed at work. Working at a ski rental shop, for example, requires knowledge about skiing, skis, and snowboards and their maintenance as well as knowledge about selecting the right kind of gear for various customers. Students also reported that they learned about what kinds of tourists would come to a specific destination. Transferable and generic knowledge and skills included, for example, language and ICT skills.

There are also outcomes for the teacher and the company providing the WBL environment. For the teacher, these include a better understanding of students' personal goals, motivations, and abilities to reflect on their skills and knowledge (especially cycle 1). The possibility of following the realization of the learning goals, both through blog posts and participation in cycles three and four, allows the teacher to follow how companies are able to meet students' learning goals, to create professional networks, to stay up to date with the industry and, lastly, to be able to control the quality of the whole WBL process.

For the company, the outcomes include having a motivated and well-prepared student for the WBL period, a true involvement in the WBL process, and a clearer picture of the responsibilities and expectations for the company and the workplace instructor through the WBL period. These outcomes are highly dependent on the success of cycles two and three. Ideally, the feedback for the company, both from the student and the teacher, provides the company with new insights and perspectives into developing their services and products.

Conclusions

This study aimed to develop a pedagogical model for meaningful WBL supported by mobile ICTs. The model consists of four cycles of negotiation that would strengthen students' active roles in and responsibility for their own learning and help focus all teaching, tutoring, and learning activities on pursuing students' learning goals. Our study revealed that mobile ICTs can amplify some meaningful learning characteristics during WBL (Figure 2). However, to take full advantage of these mobile devices requires self-regulated and motivated students who are willing to put some effort into their learning. Pimmer and Pachler (2014, p. 199) indicate that mobility of devices enable cross-contextual learning by bridging and connecting as mobile devices provide tools for creation and sharing of digital materials, enable just-in-time learning at and for work, may bridge learning in formal and informal environments, and enable several communication channels as well as ease social networking and the creation of professional networks. Finally, work and studying in tourism is in many cases highly mobile and mobile tools have the potential to provide both flexibility and efficiency to everyday work tasks as well as to WBL periods including the four negotiation cycles presented in this paper.

In this study, WBL in tourism education was approached through DBR, as it provides both structured process and openness to versatile research designs in real world settings and aims to develop both theory and practice. Our data consisted of students' online learning diaries and qualitative interviews, which reflect students' agency and activity in their learning. The data provided us with information that could be used in the development of the pedagogical model for meaningful WBL supported by mobile ICTs. As a qualitative case study, the aim was not to obtain generalizable results, but to focus on assessing and developing teaching and learning practices in WBL on a more local level. In future DBR cycles, it would be justified to focus on workplace instructors' and company managers' views and perceived additional value from their perspective. Although, the context of this study is tourism education, we see no obstacles in testing and developing this pedagogical model in other fields of VET.

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