

DESIGN, DEVELOPMENT AND EVALUATION OF A FIELD LEARNING VIDEO BLOG

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ABSTRACT

The research question in this paper is how a Field Learning Video Blog (FLvlog) has to be designed in order to optimize learning processes taking into account changed everyday communication habits of students. The system is designed to meet pedagogical as well as functional requirements for learning in fieldwork settings. The main difference to state-of-the-art learning management systems (LMS) is the ability of the FLvlog to upload fieldwork videos via smartphones and annotate them in graphical and textual form directly on the spot. A further difference is the ability to use dedicated smartphone applications for ethnographic research for data capturing with full integration into the FLvlog via software interfaces. During the fieldwork the students analyzed the experience of customers of parcel delivery companies using innovative delivery technologies as alternatives to traditional home delivery. Videos of the customer behavior were recorded and annotated by the students. The main learning aim was the application of technology acceptance models to analyze customer experience. After the fieldwork of several months, students evaluated the FLvlog in comparison to traditional paper-based case study learning. They examined the FLvlog with regard to activation, emotion, and satisfaction with the learning process, perceived learning success, and satisfaction with the FLvlog software superior to paper-based cases. From these results, implications for further improvement of the FLvlog were derived.

KEYWORDS

Field learning, video blog, ethnographic studies, case study learning, technology acceptance

1. CHALLENGES FOR STATE-OF-THE ART LEARNING ENVIRONMENTS

A number of societal and technological factors are changing the learning environments. They have strong impact on the perception of roles and information sources in the learning process. Firstly, students are struggling with an *increase in the amount of available information* (Purcell et al., 2012). In place of pure information retrieval, self-developed knowledge in the context of real-life experience gains in importance (Kong et al., 2014). In addition, finding information becomes more difficult for students because of great amounts of inappropriate information (Purcell et al., 2012) and data redundancy makes it difficult to filter relevant information. The FLvlog takes this into account by functionalities to structure information in the phases of input, application, and reflection as shown in Figure 1 and 2. By using the FLvlog the student's means of daily life communication are also used for learning within the course.

Secondly, the *number of information sources* has further increased. Beside traditional information sources, search engines are now becoming the primary source of information for students and results often do not link to the source of information (Purcell et al., 2012). This triggers uncertainties and causes a growing need for proof of authenticity of sources and content. Learning content is particularly perceived as authentic if students accepts it as useful or at least as true to life, so that the acquired knowledge can be applied in daily life (Jonassen, 1991). The FLvlog considers this by enable the application of different technology acceptance models to real life situations during the fieldwork.

Thirdly, a strong movement *from lean back to lean forward media* is observable. Unlike traditional media, which are characterized by passive consumption, interactive media allow consuming (passive use) as well as generating (active use) of content (Pagani, Hofacker, & Goldsmith, 2011). This shift can be found

especially among young people who do not see themselves in the role of passive consumers (Tapscott, D., Williams, 2008). The active role of learners includes learning processes that are based on co-production of content (Lee & McLoughlin, 2011). The FLvlog supports the movement from the lean back situation in the classroom to active fieldwork by its whole architecture as shown in figure 1 and 2. Lean forward in this context means active search for relevant real world situations in parcel distribution, making annotation in the form of text, pictures and movies in a structured way according to theoretical technology acceptance models, and sharing and discussing them with peers.

Fourthly, a *loss of importance of traditional authorities* and an increasing importance of peers is emerging in the field of information retrieval and assessment. With the proliferation of self-organized learning arrangements among peers, the traditional lecture including the typical role of the teacher as a knowledge broker loses relevance. A new autonomy of learning turns away from the traditional classroom event and allows students to use their own pace and their own learning strategies in a personalized content discovery (Blaschke, 2012). The FLvlog considers this in a twofold way. Firstly, by applying the theoretical work regarding technology acceptance models to real world their usefulness can be experienced and as a consequence, the importance of traditional authorities like university based researcher can be regained. Secondly, sharing and discussing functionalities of the FLvlog support the increased importance of peer groups.

Finally, in a mediated society, *digital media is an essential component* of everyday life and is used as a familiar means of communication by digital natives. (Thompson, 2013; (Friedl & Verčič, 2011).

2. DESIGN OF AN ACADEMIC COURSE ON TECHNOLOGY ACCEPTANCE MODELS

Based on those challenges for state-of-the art learning environments, an academic course was designed within the Master in Information Systems program at the University of Graz.

2.1 Definition of Learning Goals and Methods

The *learning method* is mainly based on a constructivist-connectivism teaching and learning conception. Within the learning environment, students are not considered as isolated but as networked individuals (Siemens, 2005). In addition, the linkage between theoretical knowledge and its application in practice should be fostered. The goal is not only to teach how to use a method but also to experience why the method is useful in a specific case and what output is to be expected. To encourage practically applicable knowledge, an experiential learning approach is applied.

As a *learning subject*, the strengths and weaknesses of innovative parcel delivery technologies were compared to traditional home delivery. Examples for such alternative methods of parcel delivery are stations for pickup parcels by the customer, delivery directly to parked cars or dynamic rerouting of the shipment by use of a mobile app. The main learning objective is to analyze the customer experience of real world application of these delivery technologies with its strengths and pitfalls. The theoretical learning subjects in this course of information systems are the application of *different methods of analyzing technology acceptance* (Platzer & Petrovic, 2011).

The students were divided in groups of five people, each group with the focus on a specific delivery method (such as pickup or self-service stations). After an introduction to the technologies for innovative parcel delivery as well as to technology acceptance models, the students were familiarized with the FLvlog and the principles of ethnographic fieldwork. Students started the ethnographic fieldwork by utilizing the FLvlog via their smartphones. Created content as well as learning outcomes of each group could be accessed by all other students. In a final event all students came together to present their major findings.

To provide authentic experiences, the learning environment supports different methods of ethnographic fieldwork such as participant observation, field protocols and photographic documentation. However, the main focus lies on annotated videos in video blogs. The videos are captured, annotated and uploaded directly in the field via smartphones.

2.2 Course Design

Figure 1 shows the course design and activities. While the first stage was completed after three weeks, second and third stages including the ethnographic study required several weeks to complete.

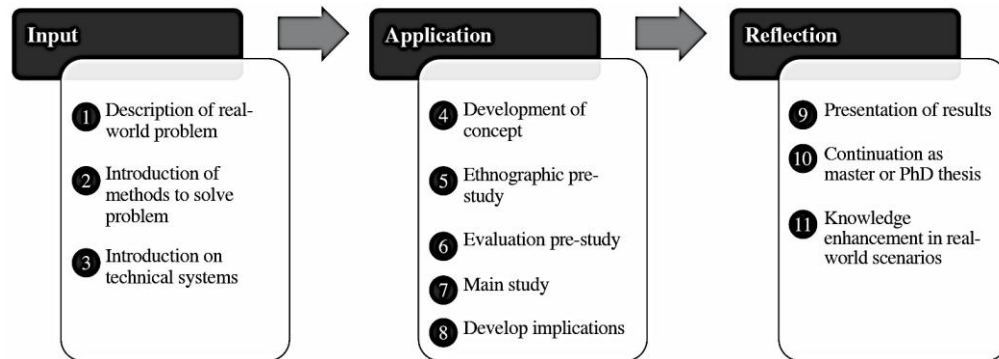


Figure 1. Course design

Phase 1 *Input*: In the first phase, *theoretical input* in the field of *technology acceptance research* from the lecturer was given in a traditional course setting requiring students' attendance. Input was provided in three different sessions. The first session concentrated on learning aims and the definition of the real world problem: acceptance of innovative technologies for parcel delivery. Secondly, the methods to analyze technology acceptance based on different theoretical models were introduced. Finally, technological aspects of the FLvlog were presented and discussed.

Phase 2: *Application*: The second phase was the main phase as it included the *fieldwork* based on the FLvlog and the interpretation of findings. Students started by developing concepts to perform the fieldwork based on state-of-the-art technology acceptance models and discussed their proposals with lecturers. Every group performed a pre-test to get an idea whether their approach and tools to observe the customer experience would lead to valid and interesting findings, otherwise modifications were advised. After this feedback the fieldwork was performed. Within this, the students recorded videos of customers using innovative technologies for parcel delivery and conducted on the spot interviews regarding the customer experience immediately after use of the technology. Afterwards, they analyzed both according to the underlying acceptance model. The main findings were annotated graphically and textually directly inside the recorded video as part of the FLvlog.

In this main phase of the course learning outcomes were manifold. Student gathered extensive insights into different *customer experience issues* of innovative technologies in the field of parcel delivery as well as into the *application of different technology acceptance models*. Knowledge from the theoretical input phase got connected to practical knowledge due to the application of technology acceptance models, together with problem solving abilities.

Phase 3 *Reflection*: The students' final step was the preparation and presentation of their results. Findings and implications were summarized in a final report, which was also uploaded to the FLvlog. A final presentation attended by all students and lecturers was organized. Students explained their findings in detail and discussed differences between the observed delivery technologies as well as their experiences in applying the different technology acceptance models.

2.3 Technical Architecture

The technical base for the *host system* of the learning environment builds on a course-specific enhanced implementation of the blogging software WordPress. The enhancements, and thus the main difference to state-of-the-art learning management systems (LMS), embrace especially two functionalities:

Firstly, students can use various mobile applications on their smartphones to gather observations and to upload it to the host system. The *integration of mobile ethnographic applications* via software interfaces into the FLvlog formed one of the core functions of the learning environment. The use of specific ethnographic apps such as *EthOS*, *Tinydesk* or *Be-There* allowed the students not only a quick and easy recording of

experiences, but also the direct transfer of all recordings into the host system. For the upload of videos, pictures, and textual and graphical annotations by students, *course-specific templates* were provided to ensure that the added content stays in a coherent structure.

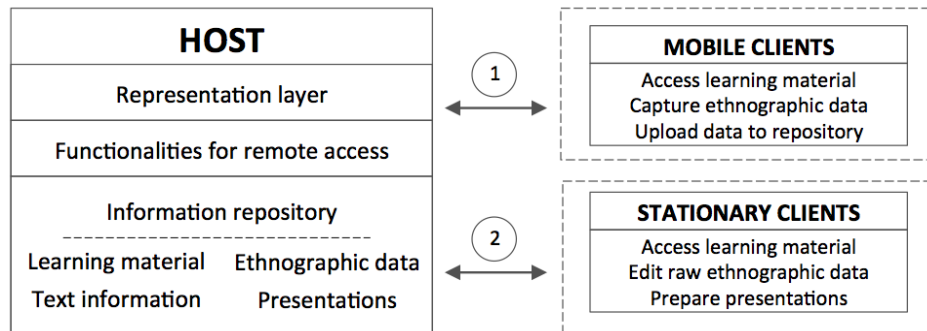


Figure 2. Technical architecture of the FLvlog

Secondly, the FLvlog offers *enhanced annotation functionality* for mobile devices like smartphones to support the fieldwork. The students are not only able to capture pictures and videos of the observed customer experience but also to annotate them with graphical and textual notes. These annotations can be made directly after the recording, also within the videos, and are an integral part of the recordings of certain customer experience episodes. The entire learning material is provided directly via the learning environment with a unique link also to smartphones via responsive design templates to support *different screen sizes*.

The *information repository* builds the base for all available functionalities and holds all kind of data related to the course. Learning material in forms of presentations, documents or photos of flipcharts is provided by the lecturers and stored in the host system. Students, on the other hand, upload their fieldwork data directly from their mobile clients to the system. The host also acts as a backup for these multimedia files. Additionally, students uploaded their final presentations and reports. Finally, the repository holds all responses, comments and feedbacks from lecturers as well as from students on uploaded material. In chronological order, students first use mobile clients (marked with a “1”) in Figure 2 to capture and then upload raw data. Mark 2 demonstrates the processing of all uploaded data. Students can download their data to their desktop computer and post-process all files in video and photo editing software to finally prepare documents for presentations.

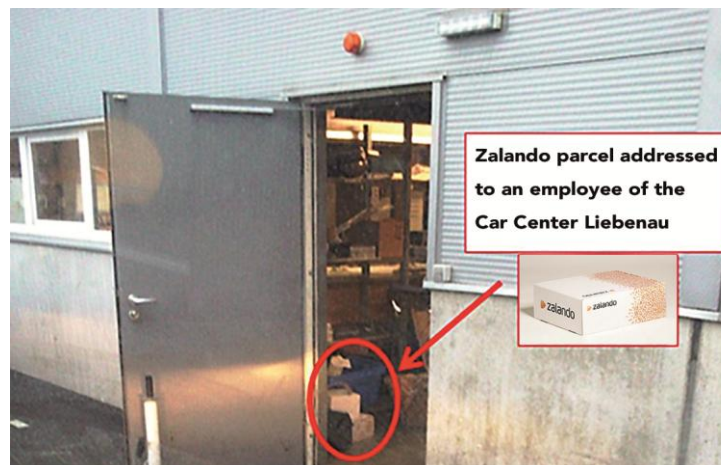


Figure 3. Example of an annotated video captured with the FLvlog

3. EVALUATION OF THE FLVLOG AND IMPLICATIONS FOR IMPROVEMENT

After finishing the course, an evaluation was performed to analyze the impact of the FLvlog on learning processes and learning outcome. After receiving their grades (to avoid a bias), all 25 students received an online questionnaire with closed and open questions. A response rate of 72% was achieved. Also in-depth interviews were conducted. The following section shows the results of the questionnaire.

The sample showed that the students already had extensive experience with online and social media prior to the lecture. About 89% use their smartphones several times a day to connect to the Internet, and about 83% use social networks like Facebook or Twitter several times a day.

3.1 Evaluation

The evaluation covered the five constructs activation, emotion, satisfaction with the learning process, perceived learning success and satisfaction with the FLvlog. For a detailed discussion of those constructs see (Platzer & Petrovic, 2011). The evaluation was designed as a *comparison* of the FLvlog with traditional paper-based case study learning. All students have experience with traditional case study learning from other courses. Thus, the results can be interpreted as advantages or disadvantages of the FLvlog in comparison to traditional paper-based case studies and can deliver some decision guidelines for teachers to move from paper-based cases to the FLvlog.

Table 1 shows the used constructs, items, quality criteria and results. Cronbach's alpha (α) was used as criterion for the internal scale consistency. With two exceptions (interest and perceived learning success) all α values are significantly higher than the required minimum value ($\alpha > 0.7$) and thus lead to a valid scale construction (Santos, 1999).

Table 1. Evaluation results of the FLvlog

Construct	Item	Range	α^*	μ^{**}	Scale
Activation	Energetic activation	1 (very strong)	0,84	1,7	Activation-Deactivation-Check-List (AD-ACLS) Imhof (1998)
		5 (none)			
Emotion	Interest	1 (very strong)	0,58	2,0	Differential Emotion Scale,
	Surprise	- 5 (none)	0,95	2,5	Merten and Krause (1993)
Satisfaction with the learning process	Free space	1 (true)	0,74	1,7	Hoover and Whitehead (1979)
	Personal judgment	-		1,7	
	Reflection	5 (false)		1,6	
	Personal initiative			1,4	
	Involvement			1,6	

Perceived learning success	Correlations	1 (true)	0,55	2,1	Likert (1932)
	Practical application	-		2,1	
	Know How	5 (false)		2,4	
	New knowledge			2,2	
	Media competence			1,7	
Satisfaction with the learning environment	Sharing options	1 (true)	0,78	1,4	Likert (1932)
	Location independence	-		1,7	
	Traceability	5 (false)		1,4	
	Usefulness			1,4	
	Transferability			1,4	

* α = Cronbach's Alpha

** μ = Mean value

Compared to paper-based case study learning, the environment shows a *high degree of activation* with a mean of 1.7. High-energy activation is generally seen as a prerequisite for affective and cognitive processes and improves the information acquisition, processing and memorization (Kittl, Edegger, & Petrovic, 2009). It also shows that the learning environment evokes *stronger positive emotions* for students than paper-based case studies. The presence of positive emotions during the use of the FLvlog is reflected in high measured values for the items of interest ($\mu = 2.0$) and surprise ($\mu = 2.5$). Strong positive emotions are crucial not only for a positive attitude towards learning content but also to ensure that the learning content is anchored in memory for a longer time (Kittl et al., 2009). In terms of satisfaction with the *learning process*, the learning environment was assessed *strongly positive*. The students appreciated the freedom to discover things themselves ($\mu = 1.7$), the use of independent judgment ($\mu = 1.7$), the possibility to reflect observations ($\mu = 1.6$), the demand for individual initiative ($\mu = 1.4$), and the feeling of being actively involved ($\mu = 1.6$).

Also for the items of *perceived learning success positive results* were obtained. This includes the ability to understand relationships ($\mu = 2.1$) and to apply newly acquired knowledge ($\mu = 2.1$). The FLvlog supports students in developing problem-solving skills they can effectively use in everyday situations. At the same time students indicated that they had extended their expertise ($\mu = 2.4$), had learned many new things ($\mu = 2.2$), and had especially expanded their media skills (1.7).

The overall *satisfaction with the FLvlog was also perceived positively*. The FLvlog supported the students to share knowledge with colleagues ($\mu = 1.4$) and allows to access content at any time and from anywhere (1.7). The learning environment was perceived not only as user-friendly and comprehensible ($\mu = 1.4$) but also as a useful tool in the context of the course ($\mu = 1.4$). Questions related to the terms of ease of use and user experience were evaluated as satisfying (Platzer & Petrovic, 2011).

3.2 Learnings and Further Research

The evaluation shows that the students *benefit* from the FLvlog applied in field learning in several ways. Compared with conventional paper-based case studies, learning process and outcomes were perceived as superior. This could be explained by changes in media usage of the students in *every day communication*

together with the use of *elaborated functionalities* of the FLvlog for in-depth analyze of the observed customer experience directly on the spot. The transferability of the FLvlog to other courses is regarded as high. 89% of all students indicated that the learning environment should be used in other seminars ($\mu = 1.4$).

Nevertheless, some optimizations for future use can be highlighted. After some weeks students requested some modification of the *rights management*. They noticed that every uploaded data was directly accessible for the whole class. Data was often directly uploaded from mobile clients to the host system without any filtering or editing. In some situations students felt uncomfortable providing data for the whole class and would rather prefer to restrict access to their own group.

A second optimization relates to the *grading process* of students. Lecturers rated posts in form of uploads (videos, pictures) as well as annotations. All kind of provided student input is eligible for grading. In some situations lecturers found it difficult to grade students, as posts were not always strictly declared as finalized for grading. Thus, lecturers did not know whether the contribution was final or still in progress. On the other hand, students were able to update posts after grading. Even if during the performed course no such case came up, it would be favorable to lock or mark posts after grading. The suggestion is to implement a state counter for posts. Posts are either in progress, prepared for grading, or graded.

The third improvement can be found also in the field of the grading process. The main part of students' workload is performed outside the classroom during the field study or in form of document preparations at home. Lecturers requested some kind of *control mechanism* to ensure every single student not only logged into the system but also performed mandatory tasks. Plugins for the FLvlog should allow the logging of user actions, which could also be used to grade students based on their own activities.

Further research should be conducted mainly in three areas. Firstly, the same course using the FLvlog should be performed more than once to gain a *large sample size* for doing more elaborate statistical analytics and gaining a higher degree of representivity and validity. Secondly, *long-term studies* with the same students using the FLvlog in different courses for a longer period of time would help to gain insights if the superiority of the FLvlog is due to its novelty and innovative character. It should be explored whether the perceived superiority would be diminished after using the FLvlog in different courses for a longer time period. Thirdly, beside the impact of the FLvlog on the perceived learning outcome also the impact on the objective learning outcomes with regard to certain predefined learning objectives should be measured and compared with traditional paper-based case study learning.

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