

The implementation of new knowledge media in education

Longitudinal research on a secondary school as a living lab, a roadmap to basic knowledge media innovation

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One of the major continuing developments in education is the appropriate use of knowledge media: media applied for generating, understanding and sharing knowledge. Currently, we talk about social media, serious gaming, apps, and of course about devices such as tablets and smart phones. The big question for teachers is: how to deal with these media developments? How to be efficient, effective and innovative at the same time? In this paper, we present the Piter Jelles Media Lab. The Piter Jelles secondary school 'struggles' with the educational implementation of ipads. We transformed the Piter Jelles into a living lab to empower them in the successful use of knowledge media, more specific the use of Ipads. We give answers to the questions as: how to transform a secondary school into a living media lab and how to implement tablets (Ipads) successfully in the education of a secondary school?

Introduction

The Leeuwarder Lyceum Piter Jelles is a public secondary school with about 900 students, offering pre-university education. The school is officially announced as a Technasium, thus paying a lot of attention to technical subjects e.g. research and design.

With approximately 11,000 students NHL University of Applied Sciences is a medium sized university of applied sciences, offering higher professional education programs which prepare students for particular professions.

Universities of applied sciences are more practically oriented than research universities. Students who successfully complete the programs are awarded a bachelor's degree. The NHL offers a wide range of study programs in a variety of fields: Healthcare and Welfare, Technology, Education and Communication and Business & Management Studies. All the fields together offer about sixty bachelor's degree programs. As a social media research group, Sowij's works together with the schools, to find

answers to above presented questions. The schools function as living media labs. Teachers, together with teacher students, teacher trainers, media professionals, and researchers work closely together in longitudinal knowledge media studies.

Three minors from NHL University cooperate in the project:

- the minor Social Media focusses on measuring the effects of the iPad
- the minor The Next Web develops iPad apps and tests prototypes
- the minor Digital Didactics focusses on using the iPad in classrooms

Three NHL lectorates initiate research by NHL students and their lecturers: the lectorate Social Media and reputation management, the lectorate Serious Gaming and the lectorate Digital Didactics. Measuring the effects of the iPad unites the research projects.

Studying the Leeuwarder Lyceum as a living lab

One of the research lines of the social media research group of NHL University of Applied Sciences (www.sowijs.nl) is 'Knowledge media in education'. In our research approach, we work closely together with schools as living labs. 'The Living Lab design and evaluation approach refers to the methodological principles involved in the development process of new products/services. The development process consists of iterative design and evaluation cycles, involves end-users in all phases, and has evaluations carried out in real-life settings with minimal obtrusiveness caused by measurement.' [2] In such a lab, teachers, together with teacher students, teacher trainers, media professionals, and researchers work closely together in longitudinal knowledge media studies. We refer to these studies as action research.

Zuber-Skerritt (1982) defined action research in higher education as "a critical collaborative enquiry by reflective practitioners who are accountable in making the results of their enquiry public, self-evaluative in their practice, and engaged in problem-solving and continuing professional development." [3]. McNiff & Whitehead (2002) offer a practical approach for practitioners to evaluate their

own work with reference to criteria set by those practitioners themselves.

Clearly, practitioners rather than academic researchers conduct action research and therefore it is often referred to as practitioner-based research. Furthermore, because it involves practitioners thinking about and reflecting on their own work, it can be considered as a form of self-reflective practice [4]. The major justification for the promotion of action-research in this study is that (a) teachers have to plan the use and effects of each of their ICT-based projects, (b) during a project they have to collect data about its use and effects, (c) after the project they have to reflect on this by analyzing their data, and (d), by doing so, they bridge their daily educational work with broad academic theory [5].

It is expected that, eventually, teachers will disseminate their findings by sharing examples of best practice, presenting their work and, if possible, publishing their research. Summarized, we see four challenges in this approach:

1. The first one is achieving and maintaining end-user commitment. In our lab, teachers, learners and even sometimes parents are end-users of new products and services.
2. Second, we want to avoid a primarily technology-driven collaboration. By considering ourselves as a lab, we aim to put the educational processes in the center instead of for instance the Ipad.
3. Third, we want to realize an active user involvement in these innovation processes. Both, teachers and students have to realize, that they'll make the difference if they actively become involved.
4. Fourth, teachers and even students become action researchers in our approach of a living lab. They become empowered and can develop themselves as professionals in innovative and successful education.

To meet these challenges, NHL Students and teachers have to develop an innovative and inquisitive attitude. NHL student teachers are intensely prepared for their future field of work. Piter Jelles secondary school continuously adjusts its efforts on education in

the 21st century. NHL University is an archetype of an organization that develops itself, developing new knowledge and distributing it to the field of work.

A roadmap to basic knowledge media innovation

We have written a roadmap to basic knowledge media innovation in order to stimulate the implementation of the iPad in secondary schools. In one year's time, we do research and monitor the implementation of the iPad in the Leeuwarder Lyceum, using this school as a living lab. The milestones of our roadmap are:

1. Research on the implementation of the iPad
2. Thinking out of the Box
3. Research on social media and iPad use by pupils
4. Raise further support for the iPad by teachers
5. Final conference

Two milestones have been reached, three lie ahead of us. In this paper, we will give a global insight in the research that has been performed.

Milestone 1: Research on the implementation of the iPad

The first research, performed by students from the minor Social Media, was an intensive qualitative study on the implementation of the iPad in Education. Venkatesh et al. introduced the UTAUT-model [5], in order to explain the acceptance and usage of new IT-solutions in organizations. The UTAUT-model combines eight previously prominent models such as the Technology Acceptance Model [6] and the Theory of Planned Behavior [7]. The UTAUT-model focusses on Performance expectancy, Effort Expectancy, Social Influence, Facilitating conditions, Anxiety, Self-efficacy and Attitude towards Behaviour.

The iPad is used by 150 pupils at the Leeuwarder Lyceum Piter Jelles. Reasons to start using the iPad was the large number of notebooks that were delivered dead on arrival previously, the presumed attractiveness of the iPad for future students and the easy-to-use kind of device. Piter Jelles' 25 teachers could test the iPad borrowing one of the schools iPads for a couple of the days. The research

was performed in the same week as the iPads were provided to the pupils. The research was done by in-depth interviews, teachers as well as their pupils have been interviewed.

Some obstacles were mentioned: teacher and pupils had to get used to the iPads soft keyboard. This is the first cohort that uses the iPad, previously, all pupils used notebooks. It takes some time to get used to the new platform.

Results show that the pupils and their teachers are enthusiast about the Performance expectancy, but the teachers are uncertain about how to use the iPad in their class. Pupils don't need extra classes on using the iPad and don't feel anxious about it. Pupils and teachers look for Apps that can replace Microsoft Office. Teachers are afraid that students will be easily distracted by games. Teachers indicate they need more time to study the impact of the iPad on their classes.

Milestone 2: Thinking out of the Box

An organization or school that has just started with the implementation of iPads, often thinks in old patterns. Existing practices should quickly be converted to new ones. Specific new "affordances" are unlikely to be exploited because organizations need to think outside the existing framework. The What's Next? week explored new applications, without taking daily practice into account. This week was organized by the NHL minor The Next Web.

Teachers from the Leeuwarder Lyceum secondary school and its pupils described their situation at school and the challenges they encounter in its classrooms. Pupils visualized their ideas in a short YouTube-video, teachers provided written input. The pupils did not formulate a well-defined assignment, but merely told what kept them busy.

Based on these briefings, about 70 NHL multimedia students created concepts for an app in a short time. The multimedia students have much knowledge of the state of design level, but little of didactics. The aim is to achieve a cross-fertilization of teaching and design. This mutual exchange enhances understanding and produces something beneficial.

After the presentation of the briefings, the multimedia students built a prototype of the app in one week, to show that it was actually possible to build it. The focus was to build an iPad application, its practical use was not the main goal.

Some challenging and promising educational application concepts have been developed:

- **Concept 1:** Strengthening the ties between pupils: pupils help each other in understanding assignments and classes, e.g. by answering each other's questions, sometimes supported by gamification.
- **Concept 2:** an app that helps pupils in order to put something into words.
- **Concept 3:** An app that let's pupils and their teacher share the ActiveBoard (interactive classroom screen).
- **Concept 4:** A platform that lets teachers and their pupils easily share videotutorials
- And many more concepts.

The main goal of the What's Next? week was to broaden the horizon of the Leeuwarder Lyceum secondary school. The concepts were diverse, the school received a broad understanding of all possibilities. The school could easily participate in the week, because these concepts were low profile and the school wasn't obliged to use it in its classes or to buy it.

It has been a week in which the multimedia students from NHL University developed their intuition. In high speed, many new and creative educational application concepts were produced. A completely new field of activity has been explored, outside students' original scope. The NHL students got used to tight deadlines, finding the true essence of a concept.

Milestones that lie ahead

In order to investigate the use of social media by secondary school pupils (milestone 3), we will perform our Pupil21 Monitor, using the Uses and Gratifications Theory by West and Turner [8]. UGT is an approach to understanding why and how people actively seek out specific media to satisfy specific needs. UGT is an audience-centered approach to understanding mass communication. Also,

research will be done on the current use of the iPad by pupils.

Common sense says that pupils use the iPad to communicate with one another and to play games, but that 'professional' use could be enhanced.

Milestone 4 on the roadmap focusses on the teachers. In order to raise further support for the iPad in their classes, we will start an App Workshop for teachers of the Leeuwarder Lyceum, aimed at finding useful new Apps. We use Rogers Diffusion of Innovations Theory [9] in order to explain differences in using this new technology in classes between. An important question by teachers will hopefully be answered by theoretical research: how to implement the iPad in the daily routine of teachers: books, tests, final exams? We will perform theoretical research on effective and innovative tablet didactics.

Finally, in a final conference, we will present all research that has been done, in order to get an overview of all the results and to evaluate the research. All three NHL minors (Social Media, The Next Web and Digital Didactics) participate in the final conference.

Conclusion

The Living Lab theory proves to be a rich environment, in which research can be done on education in the 21st century, using a powerful and promising tool as Apples iPad. We used the Living Lab theory in order to monitor the implementation and to stimulate the use of the iPad in the Leeuwarder Lyceum secondary school. The method is successful in order to obtain involvement of the teachers. We created a roadmap to basic knowledge media innovation on introducing the iPad in Education.

We used three specializations: researchers (the minor Social Media), App developers (the minor The Next Web) and students from the teacher training (minor Digital Didactics) in the project, thus benefitting from each other's knowledge and to broaden ones horizons. Students are well-prepared to their future jobs, investigating state-of the art media. Both the Leeuwarder Lyceum as well as NHL University benefit from the cooperation.

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Over Sowijs

Sowijs is het social media lab van NHL Hogeschool en een initiatief van de opleiding Communicatie. Sowijs bestaat uit een lectoraat Social Media en verschillende docenten en studenten. Samen met de praktijk werken wij aan toegepast onderzoek op het gebied van social media. De kennis en kunde die we daarmee opdoen, delen we via whitepapers en symposia.

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