Structural adoption of web lectures in higher educational programmes: impact on quality of teaching and learning

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Abstract

In this paper we reflect on research projects examining the broad and structural adaption of web lectures and e-learning within Universities and Universities of Applied Sciences. In particular the 'University 2.0' research programme (2012-2013) of The Hague University of Applied Sciences in which we researched the innovative possibilities of the structural adoption of web lectures, e-learning and its impact on the quality of teaching and learning. The main question focused on the smart and sufficient usage of new media and e-learning resulting in increasing study success.

Keywords

Web lectures, quality, teaching, e-learning, study success.

Acknowledgement

1. Introduction

Many Universities and Universities of Applied Sciences within The Netherlands were subject to exploratory research projects from 2006-2009, aiming on a broad and structural adoption of web lectures and e-learning. From 2009-2011 several institutes also participated in the OASE project of SURF (a National Collaborative organisation for ICT in Dutch higher education and research), on web lectures as a part of a new educational method (table 1).

Universities	Universities of Applied Sciences, Regional educational centres and other
- University of Amsterdam	- Amsterdam University of Applied Sciences
- Academic Medical Centre Amsterdam	- Fontys University of Applied Sciences
- ACTA Amsterdam	- Inholland University of Applied Sciences
- University Amsterdam	- Leiden University of Applied Sciences
- Delft University of Technology	- The Hague University of Applied Sciences
- Eindhoven University of Technology	- De Kempel University of Applied Sciences
- University of Twente	- Deltion College Zwolle
- Leiden University	- SURFnet, Collaborative organisation for ICT in Dutch higher education and research
- Utrecht University	
- Medical University Centre Utrecht	
- Tilburg University	
- Tias School for Business and Society	
- Maastricht University	
- Erasmus University Rotterdam (EUR)	
- Rotterdam School of Management, EUR	

Table 1: Universities and Universities of Applied Sciences within The Netherlands subject to exploratory research projects

These studies on the usage, appreciation and impact of web lectures showed that several universities eventually structurally incorporated web lectures within their organisation. The University of Amsterdam realised recording facilities in 20 college rooms. Delft University of Technology is recording 70-100 lectures per week, with 7.000-10.000 weekly users viewing over 7.000 hours of lectures. Fontys University of Applied Sciences is preparing a project in which the web lectures are used for exams and presentations of practical work / projects.

Extensive research on developments as online learning (Sitzmann, Kraiger, Stewart & Wisher, 2006; Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, & Liu, 2006 in Arbaugh, 2008), specific needs of online lectures in blended learning situations (e.g. Buchanan, MacFarlane & Ludwiniak, 2010), e-learning (Garrison & Anderson, 2003) and new media play an important role in the life of (future) students. With high-quality video recording, editing and online streaming becoming more generally accessible these new technological trends ensure that learning is taking place in a time independent environment. Gorissen' research (2003; 2011) showed that students view the web lectures at home, did not experiences great technical difficulties, prefer web lectures of all the courses and mainly use web lectures for preparation purposes of the exam. The preference of students on physically attending lectures showed no decline (Gorissen, 2003).

The evaluation of the Amsterdam University of Applied Sciences contained resembling results: students are satisfied with the web lectures, physical visits to the lectures maintained and showed no decline. Tilburg University measured an increase of success rates for the first exam from 50% to 70%, by applying and supplying digital learning material and web lectures of the courses 'Financial Accounting' and 'Management Accounting'.

Not only new ways of learning by students but also the political, financial and social changes that take place creates the sense of urgency to reflect upon the ways in which we design, develop and validate our teaching learning programmes (Diamond & Liddle, 2012:266). When Diamond & Liddle speak of the impact on the practice of teaching we are adding the value of the means on reflecting on objects of study, much like Reichard & Ringeling (2010) mention the innovations in teaching in the perspectives for the future of EGPA (2010:302). The means as we see web lectures and supporting e-learning is applicable in different study programmes. Self-reflection mentioned by Diamond & Liddle (2012:269; 274) is exactly why the integration of web lectures in educational programmes are correlated to study success, in which a graduate student should be able to reflect upon learning and requiring certain abilities necessary to their future profession.

1.1 'University 2.0' programme

This research programme explored the possibilities of the broad and structural adoption of web lectures within The Hague University of Applied Sciences. The last couple of years several new media and e-learning explorations have been realised. Not only for innovative purposes but also for individual new media activities of lecturers (e.g. wiki's, blogs, podcasts, vodcasts, social networking, online communities and e-learning modules).

In the recent development plan of the University the ambition was propagated to provide students and lecturers with the possibilities to experiment with ICT learning tools on a structural base (2009:41-42). Both the vision memorandum on 'Education and ICT' (2010) and the long term plan on 'ICT in Education' (2012) of the University were afterwards dedicated to stipulate 5 essential keystones suggesting the development of structural approach:

1) Professionalising lecturers on ICT skills
2) Digital examination

3) Digitalisation of the study choice process

4) Web lectures

5) Digital learning environment

The 'University 2.0' research programme eventually served as an incubator for other initiatives exploring and realizing the broad and structural adoption of web lectures and e-learning and the possibilities for study success within the University.

1.2 Method

This paper reflects on the results of a two year 'University 2.0' research programme (2012-2013) in which we researched the innovative possibilities of a structural adoption of web lectures and e-learning and its impact on the quality of teaching and learning. Our main question focused on the smart and sufficient usage of new media and e-learning resulting in increasing academic success or as Kolb & Kolb (2005) mention 'improving the learning process'. During the project nearly 300 web lectures were recorded by more than 40 different lecturers of 5 academies. The web lectures combined were watched over 6000 hours by bachelor students.

Recording the web lectures was made as in ornate as possible by choosing Mediasite of Sonic Foundry. After desk research this system was specifically orientated on the production of online education material, unburdening lecturers and used by all the institutes showed in table 1. All videos were saved on the internet by video servers of Mediamission in order to unburden the ICT department of the University during the exploration phase and partly due to the infrastructure viewing online video's required. E-learning was created as a supporting and facilitating platform for the web lectures, which could be easily uploaded and retrieved. We used one specific location for recording which was equipped with an existing technical infrastructure and available audiovisual support. After recording the lecture the lecturer received a web link the next day which could be shared using Blackboard or e-mail.

Despite the generic applicability of the University 2.0 research programme we used the specific numbers and results of the Academy of Public Management, Law and Safety (which recorded 90% of the overall web lecturers) and previous survey on the usage of new learning means and e-learning with EGPA delegates and participants in 2012 to reflect on Public Management orientated educational programmes (N=65).

2. Web lectures and learning

As Alford and Brock (2012) argue new forms of (interactive) learning are encouraging participation of students as well as enabling discussion (or reflection) between lecturer / students and might even deepen the learning(curve). In expressing the possible added value of web lectures they refer to the Confucian growth of learning mentioned by Garvin (1991, in Alford & Brock, 2012:3) or as Edgar Dale visualised in the 'cone of learning' (1969):
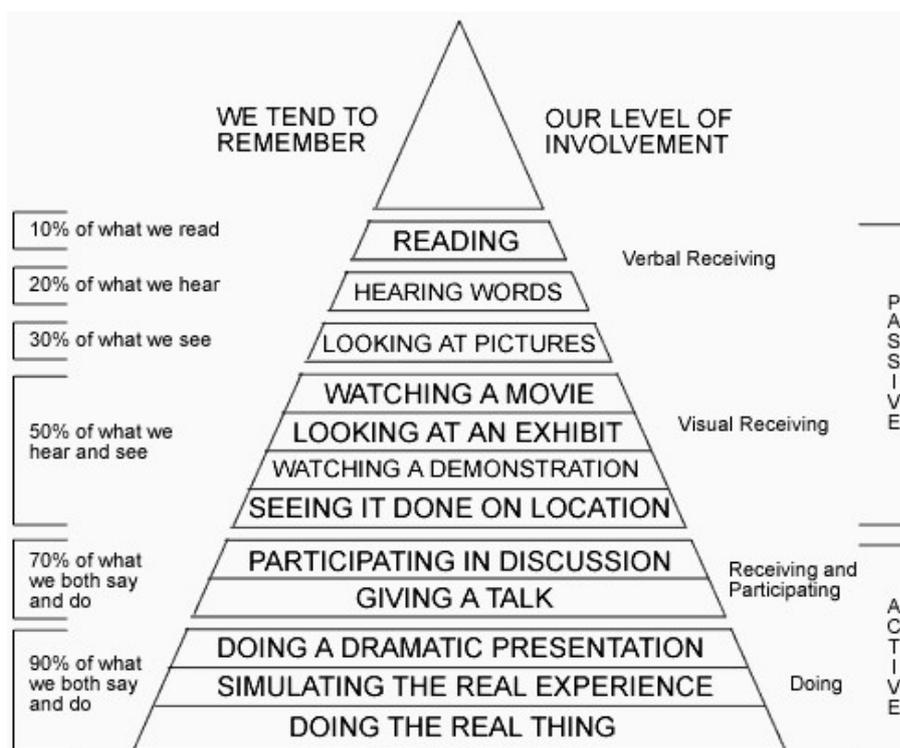

Figure 1: 'Cone of learning' by Edgar Dale (1969)

Alford and Brock also mention that video, or if we transcribe it to a web lecture, is much more efficient for preparation purposes for exams (2012:15). On the other hand Arbaugh (2008) mentioned that physical presence is a much stronger predictor of perceived learning (2008:11).

This means that a combination of both physical and web lectures (blended) could be complementary and therefore could be pursued as such. Arbaugh also notes the need for a protocol deploying e-learning and online environments with web lectures to avoid chaos (2008:4).

Buchanan et al. (2010) compared the student and lecture perceptions on web-based teaching and learning. The fact that students positively experience the availability of online material seems evident, but lecturers were moderately positive. Mostly due to the fact they feared decreased physical attendance and reduction of the student learning experiences (2010:4). The decrease of attendance is unfounded; Larkin and Preuss (2008) found that attendance increased despite the online availability of the material (In Buchanan et al., 2010). With no apparent reason for this notion Larking speculated that it may concern the increased confidence in the subject matter or lecturer (2010:3). The same issue has been addressed and underlined by McNeill et al. (2007).

The contribution of online material is seen to add value to students in terms of flexibility and assessment / exam preparation, but much like Arbaugh mentioned Buchanan et al. (2010) also postulates on the necessity of a blended learning form. As stipulated in the introduction students' grades were appreciably higher by using online lectures (Hove, 2008 in Buchanan et al., 2010:2). Ho (2009) noted an increase in understanding the material, despite audio / sound problems, impute to the possibility to pause and replay a single lecture over and over again (in Buchanan et al., 2010). Not entirely unimportant this influences the learning pace of students as well as the flexibility of time and geography as Copley (2007) studied (Choy et al., 2009 in Buchanan et al., 2010). These possibilities introduced Computer Supported Collaborative Learning and Net-bases Learning as emphasized by Illeris as hybrid or blended learning forms (Jacobs, 2013:56)

Garrison and Anderson (2003) describe these e-learning tools as applying and generating access to information and building communicative features where a landscape of learning opportunities effectuates from a blend of diverse and cohesive material into a dynamic and intellectually challenging 'learning ecology' (Garrison & Anderson, 2003:53). Designing and creating a context with appropriate levels of social presence creates congruence with the content and the reinforcement of the educational goals (2003:54).

Garrison and Anderson thoughts align with aforementioned design, development and validation notion by Diamond and Liddle (2012:266). The three characteristics for designing this kind of e-learning are (Coppoolse, 2010):

1) E-learning by distribution, behaviour, learning from information
2) E-learning by interacting, cognitive, learning from feedback
3) E-learning by collaborating, constructivism, learning form different perspectives

In line with Arbaugh (2008) Garrison and Cleveland-Innes (2005) address the importance of structured online learning environments in order to achieve successful online courses, engagement and learning (Garrison and Cleveland-Innes, 2005:137; Garrison, 2007:65-68). In realising some form of Confucian or learning progress as showed in figure 1 Gorissen (2006), citing Simons, distinguishes 7 pillars of digital didactics: establish relationships, creation, carrying out, making it transparent, learning to learn, centralizing skills / competences and flexibility. Despite the fact not all pillars are applicable on web lecturers, this notion creates insights in designing e-learning environments with amongst others web lectures.

3. Research results

3.1 'University 2.0' programme

During the project nearly 300 web lectures were recorded by more than 40 different lecturers of 5 academies. Combined the web lectures were watched over 6000 hours by nearly 1000 bachelor students.

Of the 11 evaluations realised during the research programme the following could be learned of student experiences. All students appreciated and affirmed the online material being informative and useful in better understanding the course materials. Video (PowerPoint presentation and accompanying explanation by the lecturer) prevailed above only audio. A major part of the students used the web lectures for exam preparation purposes. The lectures were used at home, in transition and at the University; sometimes in groups. Half of the number of students used it as repetition of the course material and a moderate number of students used it to catch up with a missed lecture. Applying web lectures resulted in less time

explaining theory and more quality time deepening the course material and professional applicability.

The web lectures were used as an addition to the other learning materials. After following the online module students showed significant improvement in structuring the practical work. Criticism was expressed solely on the clearness of the script of the lectures and the clear need for information density of the web lecturers. Not all students were able to retrieve the web lectures due to the Windows media file format.

Lecturers experienced the web lectures as positive due to the technical simplicity of recording and disseminating the material. No technical problems were encountered and lecturers mention the usefulness and necessity of preparing a script, which consequently takes a major part of the time invested in preparing the course. For a first recording experience / experiment the indication for a 15 minutes video entails 3 hours of preparation (of which 2 hours script preparation and 1 hour recording). Lecturers mentioned the fun they had experimenting with recording and the eventual decline of the indication recording time. Criticism and risks were seen in the unfounded claim that students use the web lectures as replacements of other learning materials and the possible lower attendance at the physical lecture. Another note contained the possible external distribution of the lecture material, which created awareness on the quality of the material and web lecture.

Most of the 270 recorded web lectures of the Academy of Public Management, Law and Safety Management could be perceived as e-learning by distribution (by Coppoolse, 2010) due to its instructive nature. In order to obtain feedback on learning by the students the web lecture and e-learning tool must be designed to realise interaction and collaboration between students and lecturer and thus creating a knowledge construction. Flexibility and the availability of online material and the learning process / results, effectuated by interaction and collaboration, resulted in less linear and cursory programmes.

3.2 Surveys EGPA delegates and participants

Of the 65 respondents 92 percent mention using e-learning for communication purposes for several years. A fairly large group uses blended learning in their PM/PA programmes and just over half of the respondents positively react on e-learning as an enabler for distance learning.

3.2.1 E-learning and student participation

Despite some 'work in progress' reactions, the need for activities on the lecturer' side and organisations which are still searching for the best tools most respondents claim that students demand even more use of e-learning to facilitate communication. There is even the experience that more usage of e-learning generates more specific questions during the physical lectures and even more during individual consults. The e-learning practices represent a new model of relationship between lecturer and student, as well as a new way to develop collaborative learning forms. It is a very good way to combine different kind of methods in learning or as a comprehensive teaching methods portfolio. With all the information and material always available and accessible by students at any given time in any place it definitely seems to increase / enhance student motivation and participation in the courses. Some of the respondents were critical on the participation effects and mentioned the insufficient character for socialization and exchanging experiences.

3.2.2 Status of supporting e-learning

Respondents mention the lack of utilizing / using it for the full potential and being not very advanced but growing steadily in its importance each year. It is seen as an important and instrumental part of the teaching portfolio yet we see some passive and partial usage of e-learning tools. The need for a blended learning option, ensuring more intensive personal contact and fluent oral communication prevails with students. These in order to guarantee a certain level that they are able to talk, discuss et cetera in personal face to face contact moments. Some respondents even mention the lack of advanced support of e-learning which negatively influences the accessibility and motivation to apply it structurally. Sometimes there simply is not enough time to fit in for instance web lectures with the current work load. If it is even adopted it is not interactive, but mere for archiving and communicating. Corporate policy seems to be lacking progress and development which results in ad hoc and very different practices and opinions. The full potential and enhancement should be further researched.

3.2.3 E-learning and teaching

This is getting more important, students (also in executive programmes) are expecting elements of e-learning. But the experience and knowledge to fully exploit the potential seems inefficient due to lack of methodological skills and practice.

It is believed that the personal contact between lecturer and student cannot be substituted by e-learning. Furthermore, e-learning seems to trigger more contact, but this type of contact is not always foreseen in the planning of activities in the organisation of teaching. An important notice is that e-learning developments change the model of teaching and knowledge management. Another remark concerns the abilities of lecturers, of which some need more support to use e-learning environments. The younger generations seems more comfortable with e-learning.

Some respondents mentioned e-learning should be used as a general framework within the new teaching methods. But more resources are required to enable exploitation of the full potential. Just like within the previous paragraph the required considerable efforts and time to design the e-learning facilities conflicts with the work load of the staff, where e-learning is expected as addition to existing class room work and preparation.

E-learning is the future of learning. Virtual classrooms are comparable to physical ones, but the notion of time has disappeared. When e-learning is organized in board postings, each student can participate at his/her own pace, in a given deadline. It is a time management challenge, but it is more flexible than a physical classroom, and less time consuming especially in terms of transportation. Moreover, e-learning is more sustainable in terms of environmental impact, since students from all over the world just need to log in on their online university. The lecturers need to adapt to virtual students, the teaching methods should be revised to be accessible by a more diverse classroom. It could be a good thing if it is embedded in the whole educational system, mixed with more 'old-fashioned' real-life educational forms, ideally virtual and real-life encounters reinforce each other.

3.2.4 Distance learning

Most of the respondents mention the potential of distance learning, approximating knowledge and managing community practices and networks. Some use Moodle and Virtual Classrooms (Adobe Connect Pro) structurally in their course programme, creating flexible learning as addition to other learning methods or reaching adult students. Moreover the incidental and exceptional cases are replaced with structural thoughts on applying it broadly.

A common reaction encompasses an increased and full integration of advanced e-learning tools, including production of content, assessments, full online degree courses et cetera as norm requiring change for students and in particular lecturers and supporting staff, disseminating knowledge. Many foresee less knowledge transfer but more explanation and guidance and fear it to grow into a dominant mode of delivery and the hollowing out of the institution. In a moderate sense of change most of the respondents believe e-learning to be utilized, sophisticated and developed much more, in different ways and offering multiple options but maintaining traditional lectures, especially in the first courses of the Bachelor studies. On an instrumental note there is a need to invest in resources broadening vision and creativity of lecturers on how to develop e-learning contents and the necessity of quality improvement and measurement.

Conclusion and discussion

The results from the 'University 2.0' research programme of The Hague University of Applied Sciences as well as the surveys amongst EGPA delegates and participants show a lot of parallel with the literature and previous studies amongst other Universities and Universities of Applied Sciences in The Netherlands.

Resembling the results of Tilburg University our research programme showed a better success rate at the first exam, suggesting that students benefit of using flexible web lecturers for preparation purposes, as suggested by Copley (2007) and Choy et al. (2009, in Buchanan et al., 2010). Also much like the experiences at the Amsterdam University of Applied Sciences and of some EGPA delegates students are overall satisfied with web lectures, finding them informative and useful in understanding course materials and increasing the quality of interaction in physical learning situations, which is in line with lessons from the literature (Alford & Brock, 2012; Kolb & Kolb, 2005; McNeil et al., 2007).

At a moderate level web lectures are used as an addition to learning materials, suggesting as Arbaugh (2008) mentioned to create a blended learning format. The remark of lecturers of decreased physical attendance and web lectures replacing other learning material seemed unfounded, much like Larkin and Preuss mentioned (2008, in Buchanan et al., 2010).

The major criticism is based on the practicality of time management preparing web lectures and placing them in an e-learning environment. Which addresses the importance of structured online learning environments as mentioned earlier by Garrison and Cleveland-Innes (2005) and by Garrison (2007). As is the need and purpose of creating a script before recording, which was suggested by Arbaugh (2008), Garrison and Anderson (2003). In contrast the possible external distribution of the lecture material created awareness on the quality of the material and therefore improving the information quantity and quality.

Throughout the 11 different inquiries the experiences were strongly positive. Students adopt web lectures swiftly without any exception (80% watched more than 4-5 lectures of the 7) with great appreciation. Our research programme also showed significant added value to study results and attending live lectures:

- Attractive education by the usage of media, time and place independent learning. The fear of declining number of students attending the live lectures was unjustified. Gorissen (2013) mentions the unaltered preference of students to attend live lectures.
- Improved quality of didactic education due to increasing presenting and media skills of lecturers as well as an increased qualitative content of the live lectures.
- Improved quality of education when students are able to review the study material more often and a higher success rate on the first examination moment (which is also endorsed by Stephenson, Brown & Griffin, 2008).
- Higher efficiency of education through reusability of lectures.
- Improved internal coordination between courses and academies through digital available educational material.

Digitally recording the lectures constructively adds to the policy themes of The Hague University of Applied Sciences as mentioned in paragraph 1.1, attractive education, larger efficiency applying web lectures, generating better quality of education material which all add up to better efficiency and graduated students.

Digital University

The strategic meaning of web lecturers strives towards more than the functional support of learning in its current form. In creating digital knowledge material (e.g. web lectures) one of the corner stone's of a structural Digital University has been explored. The other corners stones Digital Learning Environment (DLO) and Learning Management System (LMS) are already developed over the past years.
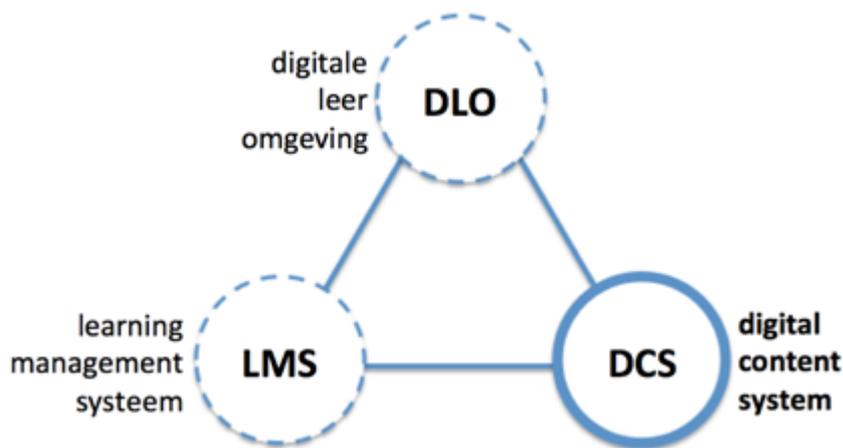

Figure 2: Corner stone's of a Digital University (2013)

Establishing, constructing and managing collections of re-usable digital knowledge is not just one of the main themes at The University of Applied Sciences for the coming years, but it will also be determinative on the quality of education. The coming period the University will transform itself to digital learning environments like many EGPA delegates agreed upon, concern wide corporation and facilities should be realised. Not only external factors in the professional fields and new (didactical) networked collaborations, much like Diamond and Liddle (2012) discussed will increasingly have its effect on educational methods and systems but also the growing need for knowledge. The quality of the digital infrastructure (e.g. e-learning platforms) which supports these developments will determine the quality of learning.

A digital University is characterised by its central Digital Content System (DCS) with didactical material enabling re-usability of knowledge in different educational forms (e.g. physical lectures, blended learning, iPad apps, readers, blogs et cetera). The flexible and modular construction of the DCS is of essence for the determination of quality within the University.

Digitalising educational material has several important consequences. Firstly improving the quality of current offered material. Web lectures stimulate lecturers to improve the quality of their material as well as its presentation. Offering web lectures adds to the attractiveness of education and learning due to the time independence in which students are able to learn accordingly.

Secondly, the growth of knowledge modules: web lectures do not by definition need to be 'lectures', but lecturers may focus on a certain question point or theoretic difficulty in a short recording, which are easily re-usable and applicable also outside the context of the lecture.

This brings us to the third consequence, the re-usage of material. Web lectures can be used for several of years. In the following years the recordings can be used as preparation and the physical lecture could focus in depth on professional cases and such. Web lectures could also be reused by different courses and academies, creating generic transferable basic courses. It could also lead to didactical renewal and coordination of the curriculum.

Fourthly the coordination of available digital material is addressed. If lecturers ought to share recorded material it has to be accessible and well structured, as premised by EGPA delegates (as well as Garrison & Cleveland-Innes, 2005; Garrison, 2007). A repository or library of digital educational material developed into a large digital collection could act as a base on which a variety of learning may take place (perhaps Open Educational Resources).

When the digitalisation of knowledge is pursued extensive collection of material grows which enables re-usability by students and lecturers. A digital infrastructure could be used and organised inside or outside the walls of the University, extending possible usage by alumni or professionals. Digitalising in this way may act as a catalyst for:

- Diversity of lectures and knowledge modules of better quality
- Collections of digital knowledge
- New networked work forms

Since web lectures are the first broad step it is of elementary value for a strategic approach towards above mentioned development. During the research programme recording seemed inornate.

Some lecturers recorded physical lectures, others recorded shorter more specific lectures or learning modules (e.g. explanation theory, specific law or calculation, exam preparation, introduction video) which can be recorded from home using a laptop and a online tool supported by the generic web lecture programme (as mentioned in paragraph 1.2.). Also inornate was the moderation of the web lectures and playing them on multimedia platforms or in web browsers.

In reaching a structural application of e-learning as a whole with web lectures and accomplishing an accompanying central DCS the first step should be to broadly facilitate the base functionality of recording and offering web lecturers as acknowledged by the EGPA delegates. After similar studies and exploratory research programmes several other Universities have already structurally incorporated web lectures within their organisation or strengthening / intensifying the applicability of web lectures (e.g. the University of Amsterdam, Delft University of Technology and Fontys University of Applied Sciences as mentioned in the introduction).

Establishing a basic digital infrastructure means preparing well installed and easy usable recording facilities in lecture rooms with its own audiovisual support. Storage and maintenance of the web lectures should not be underestimated and ought to be well structured, for instance by using National or European acknowledged and accepted meta data. The structural embedment of digital educational material has great strategic potential and should be adapted in the overall digital policy of the organization, taking into account the digital learning environment, knowledge development and reusability / exchange.

Literature

Alford, J. & Brock, J. (2012). *Using teaching objects in interactive teaching of public administration*. Annual Conference of the European Group on Public Administration. Bergen: Norway

Arbaugh, J.B. (2008). Does the Community of Inquiry Framework Predict Outcomes in: Online MBA Courses? *International Review of Research in Open and Distance Learning, Vol. 9, No. 2*

Buchanan, B., MacFarlane, R. & Ludwiniak, R. (2010). *Student Perception of On-Line*

Copley. J. (2007). Audio and video podcasts of lectures for campus-based students: production and evaluation of student use. *Innovations in Education and Teaching International, Vol.44, No. 4*, 387 -399

Coppoolse, R.E. (2010). 75 Modellen van het onderwijs [75 Models of education]. Noordhoff: Groningen

Diamond, J. & Liddle, J. (2012). Reflections and speculations on teaching and learning in public administration. *Public Policy and Administration, Special Issue 'Public Administration: The Future of the Discipline', Vol. 27, No. 3*, 265-277

Garrison, D.R. (2007). *Online Community of Inquiry Review: Social, Cognitive, and Teaching Presence Issues*

Garrison, D.R. & Anderson, T. (2003). *E-learning in the 21st century: a framework for search and practice*. Taylor and Francis: New York

Garrison, D.R. & Cleveland-Innes, M. (2005). Facilitating Cognitive Presence in Online Learning: Interaction Is Not Enough. *American Journal of Distance Education, Vol. 19, No. 3*, 133-148

Gorissen, P.J.B. (2006). Social Software in het onderwijs. Kennisnet: Eindhoven

Gorissen, P.J.B. (2013). *Facilitating the use of recorded lectures: Analysing students' interactions to understand their navigational needs*. Technische Universiteit Eindhoven. Retrieved from http://www.tue.nl/publicatie/ep/p/d/ep-uid/283170/

Jacobs, F.W. (2013). *Slagvaardig met ICT: Ontwerpprincipes voor leeromgevingen die professionale digitale competenties van hbo-studenten versterken [Decisive with ICT: Design principles for learning environments that enchance professional digital skills of college Bachelor students]*. Dissertation, Delft University of Technology.

Kolb, A.Y. & Kolb, D.A. (2005). Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. *Academy of Management Learning & Education, Vol. 4, No. 2,* 193-212

McNeill, M., Woo, K., Gosper, M., Phillips, R., Preston, G. & Green, D. (2007). Using web-based lecture technologies – advice from students, in Enhancing Higher Education, Theory and Scholarship. *Proceedings of the 30th HERDSA Annual Conference*, Adelaide, 8-11 July 2007, 365-375

OASE 2009-2011, *Eindrapportage project OASE [Final report project OASE]*. Retrieved from http://www.surf.nl/en

Reichard, Ch. & Ringeling, A. (2010). Public Administration and Teaching. *The European Group for Public Administration (1975-2010): Perspectives for the Future*. Geert Bouckaert & Wim van de Donk (Eds.). Bruylant: Brussels

Stephenson, J.E., Brown, C. & Griffin, D.K. (2008). Electronic delivery of lectures in the university environment: An empirical comparison of three delivery styles. *Computers & Education, Vol. 50*, 640-651

The Hague University of Applied Sciences (2009). *Hogeschoolontwikkelingsplan (HOP) 7 [University Development plan], 2009-2013*

The Hague University of Applied Sciences (2010). *Visie notitie Onderwijs en ICT [Vision Memorandum Education and ICT]*

The Hague University of Applied Sciences (2012). *Meerjarenplan ICT in het onderwijs (t/m 2015) [Long term plan ICT in Education (until 2015)]*