Alexander SCHMOELZ[1] (Vienna)

Elements of Multimodal Didactics: Lecture Casting

Abstract

The introduction of information and communication technology (ICT) and new media to teaching and learning has been at the forefront of debates on didactics. Yet, another important idea—multimodal didactics—is clearly on the rise. Research on literacy and didactics primarily draw on linguistic and textual aspects, but increasingly important are modes of meaning other than linguistic, including visual, audio gestural, spatial and multimodal meanings. This paper explores in how far the introduction of lecture casting can be seen as a step toward multimodal didactics? Therefore the Lecture Casting Project, present data on the strengths and developments of the project, the integration of lecture casting in didactical designs and the comparison of research finding with in-house developments will be laid out to suggest possible didactical and pedagogical improvements in regards to multimodality.

Keywords

Multi-Modal Didactics, Lecture casting, didactical design, teaching and learning, podcasting and vodcasting

Elemente multimodaler Didaktik: Vorlesungsstreaming

Zusammenfassung

Die Integration von Informations- und Kommunikationstechnologie (IKT) und Neuen Medien im Rahmen von didaktischen Designs kann als Speerspitze der Diskussion der letzten Jahre beschrieben werden. Darüber hinaus zeigen sich weitere wichtige Aspekte am Horizont der Auseinandersetzung mit Lehren und Lernen. Didaktische Designs arbeiten meist mit textuellen und linguistischen Mitteln, doch andere Formen von Bedeutung wie zum Beispiel visuelle, auditive, räumliche, haptische und gestische Bedeutungen sowie deren Diffusion in multimodaler Bedeutung werden gegenwärtiger. Dieser Artikel beschreibt die Einführung von Vorlesungsstreaming in die Hochschullehre und fragt nach den Potenzialen und Herausforderungen als Element multimodaler Didaktik. Dazu wird das Vorlesungsstreaming-Projekt, Daten in Bezug auf Stärken und Schwächen des Projekts, die Integration in didaktische Designs und der Vergleich von Forschungsergebnissen diskutiert, um Schlussfolgerungen für mögliche didaktische Innovationen vor dem Hintergrund multimodalen Bedeutungen in der Lehre zu ziehen.

[1] E-Mail: alexander.schmoelz@univie.ac.at

Schlüsselwörter

Multimodale Didaktik, Vorlesungsstreaming, didaktisches Design, Lernen und Lehren, Podcasts

1 Introduction

In recent decades didactics has been discussed in multiple manners. The notion of student-centred teaching and learning (ROGERS, 1961) and its wide range of interpretations and implementations have kicked off a quiet revolution towards creativity of all sorts (ROGERS, 1978). Furthermore, the introduction of ICT and new media to teaching and learning has been at the forefront of debates on didactics. Yet, another important idea is clearly on the rise. Debates on literacy and didactics mostly draw on linguistic and textual aspects, but "increasingly important are modes of meaning other than Linguistic, including Visual Meanings (images, page layouts, screen formats); Audio Meanings (music, sound effects); Gestural Meanings (body language, sensuality); Spatial Meanings (the meanings of environmental spaces, architectural spaces); and Multimodal Meanings. Of the modes of meaning, the Multimodal is the most significant, as it relates all the other modes in quite remarkably dynamic relationships" (CAZDEN, 1996, p. 80). Together this constitutes "a quiet revolution, then, which extends literacy to explore how visual, text and audio data is authored and interpreted, and also extends medium, to recognise multiple ways in which information is conveyed and meaning made" (CRAFT, 2012, p. 186).

Against this background, this paper wants to discuss in how far the introduction of lecture casting can be seen as a step toward multimodal didactics? Therefore one will introduce the Lecture Casting Project, present data on strengths and developments of the project, the integration of lecture casting in didactical designs and overall comparison of international research finding with in-house developments to suggest possible didactical and pedagogical enhancements in regards to multimodality. This paper describes: (1) the general framework, key milestones, developments and statistics of the Lecture Casting Project; (2) the conducted evaluation and research results from the lecture casting service; (3) research literature on lecture casting and (4) possible research-driven and literature-driven pedagogical and didactical enhancements towards an integration of visual and audio meaning to teaching and learning.

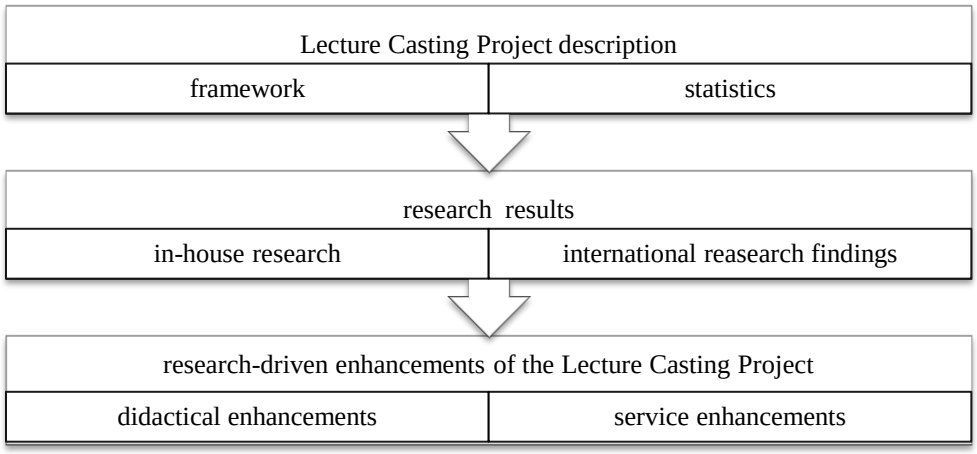

Fig. 1: Overview

In conclusion, one will gain insight into the circumstance of one of the largest universities in Europe under which lecture casting provides a suitable service for innovative teaching and learning as well as an outline of possible multimodal didactical improvements.

2 Implementing lecture casting

The Lecture Casting Project offers podcasting and live video streaming for the seven biggest lecture halls at the University of Vienna. The main objectives of the project are to equip major lecture halls with lecture-casting technologies, to provide automatic recording of lectures for podcasting and live video streaming. Additionally, integrating lecture casting resources into didactical designs aims to innovate and improve teaching and learning. Pedagogical benefits derive from the facile creation of high quality audio and visual learning material for students. Therefore, students can learn wherever and whenever they are motivated. For example the Lecture Casting Project provides these multimodal audio and visual resources, in addition to traditional print-based resources, which allows students to 're-view' or 're-listen' parts of the lecture so they can revise their work and better prepare themselves for the next lecture or an upcoming exam. This new flexibility meets the demands of students busy lives whether they are employed, have special needs or need to take care of children or family members.

The entire lecture casting operation system is easy to use for lecturers and is operated via a web-based interface. Recording and publishing podcasts is handled in a three step process. First, lecturers need to register their lecture via the web interface. At that point all legal issues are handled and the lecturers fill in an online declaration of consent so that the university gets the right to process the data on the streaming server. This creates a link for the learning management system. Second, the lecturers need to press a button at the beginning of the class, so that the recording starts. After the lecture, the professors will receive an e-mail in which the podcast link or the streaming link, respectively, is indicated. Lastly, lecturers can pub-

lish this link at e. g. the learning management system or their personal homepage, so that the students get access to the pod- and vodcasts.

Lecturers can choose from four different kinds of recording: audio, audio and screencast, audio and video (small scale) as well as audio and video (large scale). The amount of registered lecture series and episodes, respectively, increased steadily.

	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Total series
Total registrations	27	29	32	45	56	189
Including live-streaming	8	11	14	22	24	79

Fig. 2: Amount of registered lecture series and episodes

Engaging in Fig. 2 one can see that there is a steady increase in registrations and records of podcasting and live streaming series. The Lecture Casting Project started with a total amount of 27 series in spring 2010 and almost doubled the amount in fall 2011 with a total of 45 series and again showed an increase to 56 in spring 2012.

The breakdown of the live series, by type of recording, is detailed below:

	Total episodes
audio	102
audio and screencast	570
audio and video (small scale)	167
audio and video (large scale)	177
	1016

Fig. 3: Amount of recorded episodes

By October 2011 the Lecture Casting Project provided 1016 episodes in total. Fig. 3 illustrates that audio and screencast is by far the most popular recording method. Large-scale video recording is more demanded than small-scale video recording. Audio recording is the least popular form of capturing lectures.

From January 2011 until the end of May 2011 the total amount of views increased to 39.163. Some popular episodes have up to 2.400 hits. The most views have been shown at the Department of Communication (8.606), the Department of English (7.641) and the Faculty of Psychology (6.661).

3 Research Results: Strengths and challenges of lecture casting

The crucial question of the Lecture Casting Project evaluation process was why students and lecturers use and do not use, respectively, the lecture casting service. Engaging this question the research team conducted interviews and questionnaires with students and teachers to evaluate the degree and patterns of utilization. Moreover, the team held focus group discussions with lecturers to look at the causes of using and not using the lecture casting service as well as to get input for further developments and enhancements of the lecture casting service.

The quantitative questionnaire was conducted with teachers and students in spring term 2010. The students' responses have shown that 78.1 % (n=980) are using lecture casting. The most popular causes of utilizing lecture casting (n=751) are receiving missed classed (81.4 %), preparing for exams (74.7 %) and refining lecture notes (69.9 %). Students' have also mentioned (n=830) that providing downloadable audio (49.6 %) and video (56.1 %) is more satisfactory than providing audio (23 %) and video (40.1%) as streams. Looking at the teachers' answers (n=17) one can see that 76.4 % have been very satisfied or satisfied with the lecture casting service. The reasons they cite for being satisfied include using lecture casting to provide supplement material for students to prepare for exams (88.2 %), to revise the content of the latest lecture (82.4 %), to foster flexible learning (82.4 %), and to support employed students (82.4 %). Most of the lecturers are publishing vod- and podcasts via the learning management systems (76.4 %) and some via a homepage (23.5 %). 73.4 % of lecturers responded that they are very satisfied or satisfied with the ease of handling the technical infrastructure, whereas 29.4 % mentioned that they had problems with starting the recording in the lecture hall.

The conducted interviews with students and teachers can be summarized as follows:

- Teachers are providing their lectures as vod- and podcasts due to two main reasons: First, lecturers want to give students the opportunity to re-watch their speeches for preparation of exams, to revise their notes and to re-listen parts which might have been hard to understand. The second reason refers to the high number of first-year students. Lectures want to provide podcasts so that all students can "attend" the classes and gain interactivity via online dialog based on lecture casts. This reason goes hand in hand with the students' answers.
- Students are very thankful because lecture casting allows them to avoid overcrowded lecture halls and also gives them the possibility the engage in discussions in reference to the vod- and podcasts. Over all, students are very satisfied with the lecture casting service and they would appreciate a further engagement of the University to foster broader coverage of lectures.

The findings of the focus groups are manifold. Clear and structured topics have guided the groups and time has been granted for free exchange as well as further concerns and requests. Three main topics were discussed: the future of lecture cast-

ing, technological support for lecturers, and suggestions for lecture casting enhancement. In regards to the "Future of lecture casting" concern was voiced over diminishing student appreciation of face-to-face teaching. Lecturers questioned the benefits of lecture casting for learning and some were opposed to financial resources being designated for further upgrading of lecture casting. They felt resources should also be designated for face-to-face teaching. The strongest concern articulated by lecturers in the focus group discussions was that lecture casting was a time consuming process. Moreover, lecturers also reported being anxious due to the publicity of their teaching practices and possible copyright infringements in case they use external pictures, videos, sounds or textual materials. Taking these concerns into account the lecturers' suggested personal support should be made available to solve possible problems with new technologies or copyright issues they could potentially encounter. Furthermore, they articulated they would need support to rework their presentations based on copyright laws in setting up all web-based application, which are linked to publishing the lecture casts via the online learning management system. Finally they also noted that professional coaching in regards to speaking in front of cameras and media-didactical consulting would be helpful

4 Learning from literature: benefits of applying lecture casting

A review of literature on lecture casting in higher education shows results on (A) the utilization of lecture casting, (B) its effects, (C) didactical implementations and (D) students perception of class delivery as the most salient elements. Regarding (A) the usage of lecture casting, research has shown that podcasts are used as additional learning material (BONGEY, CIZADLO, & KALNBACH, 2010), to revise parts of lectures after they have been attended (COPLEY, 2009; LONN, & TEASLEY, 2009), and to support learning and to prepare for exams (LONN, & TEASLEY, 2009). There are two further findings: First, it becomes obvious that students do not want that podcasts replace actual lectures and that providing lecture casting does not have an effect on the attendance rate in most cases (BONGEY, CIZADLO, & KALNBACH, 2010; COPLEY, 2009; FERNANDEZ, SIMO, & SALLAN, 2009; LONN, & TEASLEY, 2009). Second, various scholars have shown that mobile learning is rather a myth than reality in higher education. Most of the students still use their PC or Laptops to receive their podcasts and mobile device are rarely used (COPLEY, 2009; LONN, & TEASLEY, 2009).

The (B) effects of lecture casting are widely discussed and mainly focused on performance and students perception. BAKER, HARRISON, THORNTON, & YATES (2011) have conducted research on the effects of providing podcasts as supplement material in regards to the exam scores. The scholars concluded that the availability and use of podcasts had no significant difference on student learning (BAKER, HARRISON, THORNTON, & YATES, 2011). Conversely, FERNANDEZ, SIMO, & SALLAN (2009) have shown that availability of podcasts increase the students' impression of permanent contact between students and teachers. This increase in the self-perceived learner-to-teacher interaction increases the probabili-

ties of obtaining a better course grade and increases students' motivation (ABDOUS, & YEN, 2010; FERNANDEZ, SIMO, & SALLAN, 2009). Furthermore, BOSTER, MEYER, ROBERTO, INGE, & STROM (2006) illustrate that having been exposed to video streaming increases examination performance of students. Also ROEHL (2013) showed a high level of student engagement when integrating video in teaching. Unfortunately, non of these scholars have been looking at, neither the degree of integrating lecture casting into didactical designs, nor the quality of the delivered video. MORAIN, & SWARTS (2012) point to the fact that specific roles of modal and multimodal content have effects on the quality of video-based course delivery. LAZZARI (2009) has integrated lecture casting as student assignments in didactical designs and the results show that e. g. assignments which foster the production of podcasts by students increase exam scores, foster cognitive elaboration, and enhance students' critical thinking. Moreover, ZORN (2011) has suggested that integrating lecture casts into didactical designs foster the learning process regarding the production of knowledge and embeds online interaction into a content related framework.

Related to (C) the way of integrating lecture casting in didactical designs, FILL, & OTTEWILL (2006) concluded that the availability of lecture casts as supplement course material is not sufficient to promote students' learning. Rather an approach that fosters the integration of lecture casting via assignments, guiding questions, quizzes, and structured references unfolds the great potential of podcasting and streaming in higher education. "It is not enough to leave the learners alone to paddle, sink or swim in the stream" (FILL, & OTTEWILL, 2006, p. 406). Furthermore, WHITHAUS, & MAGNOTTO (2006) have shown benefits of integrating videos for teachers that want to engage into social constructionist pedagogy, and so integrating lecture casting becomes, both, a technical and a pedagogical innovation

Looking at (D) the students' perception of class delivery one can see that students' do not agree with substituting face-to-face lectures with podcasts. COPLEY (2007) has found one circumstance under which students' would think differently: If this substitution would lead to more financial resources for small-scale classes and a better teacher-to-student ratio. Moreover, providing podcasts instead of lectures would not be a problem in regards to the self-perceived learner-to-teacher interaction. ABDOUS, & YEN (2010) showed that the level of self-perceived learner-to-teacher interaction remained constant across delivery mode groups 'face-to-face' and 'live-streaming' and they conclude that the "delivery mode was not a useful predictor for self-perceived learner-to-teacher interaction" (ABDOUS, & YEN, 2010, p. 254).

5 Discussion: Enhancing lecture casting to foster innovative teaching and learning?

The outcomes of in-house research results and literature review are diverse: (1) The Lecture Casting Project needs to reflect on how to overcome the discrepancy between the subjective feeling of lectures and research results on the impact of lecture casting on class attendance. Looking at research on the utilization of lecture casting in higher education it is to note that providing lecture casting does not lead

to a decline of class attendance (BONGEY, CIZADLO, & KALNBACH, 2010; COPLEY, 2009) because (2) students mostly use lecture casting to receive missed classes (81.4 %), prepare for exams (74.7 %), refine lecture notes (69.9 %), as additional learning material (CIZADLO, & KALNBACH, 2010), to revise parts of lectures after they have been attended (COPLEY, 2009; LONN, & TEASLEY, 2009), and to support learning (LONN, & TEASLEY, 2009). Based on the students' utilization of lecture casting, further engagement can be enhanced by (3) interlinking casting material with student-centred didactical approaches. FILL, & OTTEWILL (2006), LAZZARI (2009) and ZORN (2011) have illuminated that the integration of podcasts into didactical designs via assignments, guiding questions, quizzes, and structured references unfolds a great potential for learning regarding the production of knowledge, embedment of online interaction into a content related framework. Moreover, lecture casting has the potential to increase exam scores, foster cognitive elaboration, and enhance students' critical thinking. Taking these facts into account, the professional integration of lecture casts in student-centred designs is crucial to fully engage the learning opportunities of pod- and vodcasts. Therefore, (4) broad didactical consultancy and instructional support is indispensable to enable teachers to professionally manifest lecture casts in a student-centred and multimodal manner and, furthermore, to overcome the anxiousness in regards to new technologies or copyright issues as shown by the in-house research.

6 Lecture Casting as an Element of Multi-Modal Didactics

Offering an automatic lecture casting system that enables teachers to provide visual and audio meaning for students in a facile and easy to handle way is a very satisfying starting point for teachers and students but it is by far not sufficient, in itself, to unfold the full potential of multimodal didactics for innovative teaching and learning. On account of the possible benefits of lecture casting, as illustrated by FILL, & OTTEWILL (2006), LAZZARI (2009) and ZORN (2011), there is a crucial need to foster the professional integration of pod- and vodcasts into multimodal didactical designs. Interlinking visual and audio meaning of lecture casting with spatial and gestural meaning can attend to multimodality to a greater extent and can, therefore, unfold the pedagogic potentials of multimodal literacy (WALSH, 2009).

However, lecture casting can be described as an important step from textual to visual and audio meaning, the passive state of learners jeopardizes the great potential of multimodal didactics. Only if didactics assemble a wide range of modes of meaning in a manner that students can actively engage in de-designing and re-designing the visual and audio meanings of provided lecture casts, greater pedagogical benefits can emerge. "Important in students' redesign is how multiliteracies as a theoretical framework connects the concept of redesign to transformed practice" (WALSH, 2009, p. 134). Didactically interlinking the notion of transformed practise (CAZDEN, 1996) with students re-design can fully embrace the advantages of lecture casting in the context of multimodal didactics.

Developing professional multimodal didactics for transformed practise in regards to lecture casting demands profound pedagogical skills and media-didactic know-

how. Moreover, most lecturers articulate the necessity of assistance to handle new technologies and tackle copyright questions. Hence, Universities should engage into providing broad didactical consultancy and qualification to assure the possible benefits of lecture casting and multimodal didactics. Further research on interlinking multimodal didactical designs, student centred methods, transformed practise and lecture casting can shed light on the pedagogic potentials of multimodal didactics and might highlight strengths and weaknesses for teaching and learning.

7 References

Abdous, M., & Yen, C-J. (2010). A predictive study of learner satisfaction and outcomes in face-to-face, satellite broadcast, and live video-streaming learning environments. *Internet and Higher Education, 13*, 248-257.

Baker, R., Harrison, R., Thornton, B., & Yates, R. (2011). Podcasting In Higher Education: Does It Make A Difference? *American Journal of Business Education, 3*(6), 7-10.

Bongey, S., Cizadlo G., & Kalnbach, L. (2006). Explorations in course-casting: Podcasts in higher education. *Campus-Wide Information Systems, 23*(5), 350-367.

Boster, F. J., Meyer, G. S., Roberto, A. J., Inge, C., & Strom, R. (2006). Some Effects of Video Streaming on Educational Achievement. *Communication Education, 55*(1), 46-62.

Cazden, C., Cope, B., Fairclough, N., Gee, J. et al. (1996). A pedagogy of multiliteracies: Designing social futures, *Harvard Educational Review, 66*(1), 60-92.

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, 44*(4), 387-399.

Craft, A. (2012). Childhood in a digital age: creative challenges for educational futures. *London Review of Education, 10*(2), 173-190.

Fernandez, V., Simo, V., & Sallan, J. M. (2009). Podcasting: A new technological tool to facilitate good practice in higher education. *Computers & Education, 53*, 385-392.

Fill, K., & Ottewill, R. (2006). Sink or swim: taking advantage of developments in video streaming. *Innovations in Education and Teaching International, 43*(4), 397-408.

Habermas, J. (1981). *Theorie des kommunikativen Handels*. Frankfurt am Main.

Lazzari, M. (2009). Creative use of podcasting in higher education and its effect on competitive agency. *Computers & Education, 52*(1), 27-34.

Lonn, S., & Teasley, S. (2009). Podcasting in higher education: What are the implications for teaching and learning? *Internet and Higher Education, 12*, 88-92.

Morain, M., & Swarts, J. (2012). YouTutorial: A Framework for Assessing Instructional Online Video. *Technical Communication Quarterly*, *21*(1), 6-24.

Roehl, A. (2013). Bridging the Field Trip Gap: Integrating Web-based Video as a Teaching and Learning Partner in Interior Design Education. *Journal Of Family & Consumer Sciences*, *105*(1), 42-46.

Rogers, C. R. (1961). *On Becoming A Person*. Boston: Houghton Mifflin Company.

Rogers, C. R. (1978). *On Personal Power. Inner strength and its revolutionary impact*. London: Constable.

Walsh, C. (2009). The multi-modal redesign of school texts. In L. Tan Wee Hin, & R. Subramaniam (Eds.), *New Media Literacy at the K-12 Level* (pp. 32-47).

Walsh, M. (2009). Pedagogic Potentials of Multimodal Literacy. *Journal of Research in Reading, 32*(1), 126-136.

Whithaus, C., & Magnotto N. J. (2006). Contact and Interactivity: Social Constructionist Pedagogy in a Video-Based, Management Writing Course. *Technical Communication Quarterly*, *15*(4), 431-456.

Zorn, I. (2011). Educasting. Wie Podcasts in Bildungskontexten Anwendung finden. In M. Ebner, & S. Schön (Eds.), *Lehrbuch für Lernen und Lehren mit Technologien*. Graz: L3T.

Acknowledgements

I want to express my gratitude to the Center of Teaching and Learning of the University Vienna, especially to Silvia Grillitsch for leading the Lecture Casting Project and giving me the opportunity to reflect on the projects outcomes from a theoretical point of view. Additionally, I want to thank Alessandro Barberi and Chris Walsh for their constructive feedback as well as for revising and editing the paper.

Author

Mag. Alexander SCHMOELZ || University of Vienna, Department of Education || Sensengasse 3a, A-1090 Wien

medienpaedagogik.univie.ac.at

alexander.schmoelz@univie.ac.at