

Analytics on Video-Based Learning

Michail N. Giannakos^{1*}, Konstantinos Chorianopoulos², Marco Ronchetti³, Peter Szegedi⁴,
Stephanie D. Teasley⁵

¹Dept. of Computer and Information Science, Norwegian University of Science and Technology, Trondheim, Norway

²Department of Informatics, Ionian University, Corfu, Greece

³Dipartimento di Ingegneria e Scienza dell'Informazione, Università di Trento, Povo di Trento, Italy

⁴Trans European Research and Education Network Association (TERENA), Amsterdam, The Netherlands

⁵School of Information, University of Michigan, Ann Arbor, MI, USA

michail.giannakos@idi.ntnu.no

ABSTRACT

The International Workshop on Analytics on Video-based Learning (WAVE2013) aims to connect research efforts on Video-based Learning with Learning Analytics to create visionary ideas and foster synergies between the two fields. The main objective of WAVE is to build a research community around the topical area of Analytics on video-based learning. In particular, WAVE aims to develop a critical discussion about the next generation of analytics employed on video learning tools, the form of these analytics and the way they can be analyzed in order to help us to better understand and improve the value of video-based learning. WAVE is based on the rationale that combining and analyzing learners' interactions with other available data obtained from learners, new avenues for research on video-based learning have emerged.

Categories and Subject Descriptors

K.3.1 [Computer Uses in Education] Computer-assisted instruction (CAI), Distance learning; J.1 [Administrative Data Processing] Education

General Terms

Measurement, Design, Experimentation, Human Factors,

Keywords

Video Based Learning, MOOCs, Learning Analytics, Interaction Design.

1. BACKGROUND OF THE WORKSHOP

With the widespread adoption of video-based learning systems such as Khan Academy and edX, new research in the area of Learning Analytics has emerged. Even new for-profit companies, such as Coursera and Udacity, have started offering forms of instruction that are primarily video-based. To date, universities across the globe (Stanford, Oxford, MIT and some 800 other schools) offer video lectures on topics from Algebra to Zoology.

The use of video for learning has become widely employed in the past years [3]. Many universities and digital libraries have incorporated video into their instructional materials. Massive Online Open Courses (MOOCs) are becoming an increasingly important part of education. For instance, students access academic content via digital libraries, discuss with tutors by email

and attend courses from their home. In order to support video learning, various technological tools have been developed. For example, Matterhorn and Centra are just few of them. These tools provide an easy way for a learner who has missed a lecture to catch up, but also enable other, especially slow learners, to review difficult concepts.

Many instructors in higher education are implementing video lectures in a variety of ways, such as broadcasting lectures in real time, augmenting recordings of in-class lectures with face-to-face meetings for review purposes, and delivering lecture recordings before class to “flip the classroom” and provide hands-on activities during class time. Other uses include showing videos that demonstrate course topics and providing supplementary video learning materials for self-study.

Millions of learners enjoy video streaming from different platforms (e.g., YouTube) on a diverse number of terminals (TV, desktop, smart phone, tablets) and create billions of simple interactions. This amount of learning activity might be converted via analytics into useful information [1, 5] for the benefit of all video learners. As the number of learners' watching videos on Web-based systems increases, more and more interactions have the potential to be gathered. Capturing, sharing and analyzing these interactions (datasets) can clearly provide scholars and educators with valuable information [7]. In addition, the combination of learner profiles with content metadata provide opportunities for adding value to learning analytics obtained from video based learning.

To explore the future of video-based technologies for teaching and learning, we aim to build a research community around this topical area, to brainstorm about what the next generation of video-based learning tools might look like, what kind of data can be collected, and how these data can help us to better understand and improve the value of video-based learning.

Existing empirical research [e.g. 2, 3, 4, 6] has begun to identify the educational advantages and disadvantages of video-based learning. However, there still remain many essential unexplored aspects of video-based learning and the related challenges and opportunities; such as, how to use all the data obtained from the learner, how to combine data from different sources, and so on. WAVE aims to support this research endeavor through an analytics approach to video-based learning. In particular, the objective of this workshop is to bring together researchers,

Copyright is held by the author/owner(s).

LAK '13, Apr 08-12 2013, Leuven, Belgium

ACM 978-1-4503-1785-6/13/04.

** This work was carried out during the tenure of an ERCIM "Alain Bensoussan" Fellowship programme. The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no 246016.*

designers, teachers, practitioners and policy makers who are interested in how to do research on the use of any form of video technology for supporting learning. This workshop will provide an opportunity for these individuals to come together, discuss current and future research directions, and build a community of people interested in this area.

By taking into account learners' interactions and many other data—such as students' demographic characteristics of gender, ethnicity, English-language skills, prior background knowledge, their success rate in each section, their emotional states, the speed at which they submit their answers, which video lectures seemed to help which students best in which sections, etc.—new avenues for research in the intersection of video-based learning and analytics are now possible.

2. WORKSHOP OBJECTIVES

The workshop will be an interactive, engaging experience that will motivate participants to get involved and engage in fruitful discussions on the topic of Video-Based Learning and the potential benefits of Analytics. To do so, it will combine several activities. First, highly recognized keynote speakers will open the workshop. Then the workshop organizers will give the participants the opportunity to be engaged into creative and motivating discussions about the key issues related to analytics on video-based learning.

One of our main objectives is to bring together researchers who are interested on Learning Analytics and their application on video-based learning. Specifically, WAVE aims to provide an environment where participants will get opportunities to: develop their research skills; increase their knowledge base; collaborate with others in their own and complementary research areas; and discuss their own work. In particular, guiding questions and themes include:

- What might next generation of analytics enhanced video learning tools look like?
- What kind of data can be collected from video-based learning tools?
- How these data can help us to better understand and improve the value of video-based learning?

3. ABOUT THE FACILITATORS

Michail N. Giannakos is an ERCIM/Marie Curie Fellow in the Department of Computer and Information Science at Norwegian University of Science and Technology (NTNU) and a Visiting Richard T. Cheng Fellow in the Center for Real-Time Computing, Virginia, USA. Giannakos is interested in how people learn in the presence of technology and each other. Since 2010, he is a member of the IFIP Working Group 3.1 on Informatics and ICT in Secondary Education.

Konstantinos Chorianopoulos is Lecturer in the Department of Informatics at the Ionian University, Corfu, Greece. He has been a post-doctoral Marie Curie Fellow from 2006 to 2011. In 2002, he founded UITV.INFO, which is a newsletter (currently a discussion-group) and web portal for interactive television research resources (papers, theses), news and events. He is serving on the steering committee of the European Interactive TV organization and on the editorial boards of the following journals:

Computers in Entertainment (ACM), Entertainment Computing (Elsevier), Journal of Virtual Reality and Broadcasting.

Péter Szegedi is Project Development Officer of Trans European Research and Education Network Association (TERENA). He is also secretary of TF-Storage, TF-Media, TF-NOC, and the GLIF Technical Working Group as well as coordinator of the End-to-End Network Provisioning issues and the Video & Web Conferencing activities and looks after the NRENum.net service. He participated in the EC funded projects such as FP7-FEDERICA (leader of NA2 & JRA2 activities) & IST-MUPBED.

Marco Ronchetti is a CS professor at the Department of Information Engineering and Computer Science at the University of Trento, Italy. He is author of more than hundred peer-reviewed research articles in several international journals and conferences, and over the last ten years his interests have focused in the area of Educational Technology, especially in the area of video-supported learning. He has been a director of the Master in Technologies for System Integration and e-Government.

Stephanie D. Teasley is a research professor at the School of Information and the director of the USE Lab at the University Library, whose mission is to investigate how instructional technologies and digital media are used to innovate teaching, learning, and collaboration. Teasley's research utilizes Learning Analytics to categorize and simplify the vast amount of data on student engagement and learning available in the campus Learning Management System. She is on the Executive Board of the Society for Learning Analytics Research (SoLAR).

4. ACKNOWLEDGMENTS

We would like to thank Dr. George Siemens and Dr. David Geerts for accepting our invitation to give keynote presentations, the workshop Program Committee members for accepting our invitation and the workshop chairs for their constructive comments and their helpful assistance.

5. REFERENCES

- [1] Chorianopoulos, K., Leftheriotis, I. & Gkonela, C. 2011. SocialSkip: pragmatic understanding within web video. In Proceedings of EuroITV'11, 25–28.
- [2] Giannakos, M. N. & Vlamos, P. 2013, Using webcasts in education: Evaluation of its effectiveness. British Journal of Educational Technology. doi:10.1111/j.1467-8535.2012.01309.x
- [3] Giannakos, M. N. 2013. Exploring the research on video learning: A review of the literature. British Journal of Educational Technology.
- [4] Lonn, S. & Teasley, S. D. 2009. Podcasting in higher education: What are the implications for teaching and learning? The Internet and Higher Education, 12, 88-92.
- [5] Mertens, R., Farzan, R., & Brusilovsky, P. 2006. Social navigation in web lectures. In Proceedings of HYPERTEXT '06, 41-44.
- [6] Ronchetti, M. 2010. Using video lectures to make teaching more interactive, International Journal of Emerging Technologies in Learning (iJET), 5 (2), 45-48.
- [7] Verbert, K., et al., 2011. Dataset-driven Research for Improving Recommender Systems for Learning. In Proceedings of LAK '11, 44-53.