

Between MOOCs and Service-oriented Education: If Students Had the Choice

Thomas Richter
University of Applied Sciences Bonn-Rhein-Sieg

Heimo H. Adelsberger
University of Duisburg-Essen

Pouyan Khatami
University of Duisburg-Essen

Enterprises demand universities not to limit education to theoretical knowledge, but instead, to prepare students for future challenges in the job. While demanding a focus on current technologies and practices appears reasonable, it contradicts academia's general focus on sustainable knowledge. This "conflict-of-interest" can be bridged through extra-curricular professional training. MOOCs are hyped as solution because they allow to simultaneously addressing masses of students. However, with the increasing number of learners, anonymity in education increases and first-level support decreases. Within the extra-curricular online program erp4students we found that individual support is considered most relevant to successfully complete professional training.

INTRODUCTION

Since many years, enterprises claim that academic education generally should focus more on the particular demands from the world of works instead of exclusively teaching theoretical concepts, models, and methodologies. In order to directly generate a return on investment, it should be possible to involve alumni in day-to-day routines right after they achieved their degrees. Universities, on the other hand, promise to deliver sustainable knowledge and general methodological competences. Particularly in the general fields of Information Systems and Computer Science, and even more, in the context of Production and Operations Management, the claim from economy is directly related to currently popular applications, which suddenly might change with the emerging of new technologies and concepts.

Bologna and the Sorbonne declaration in Europe (Sorbonne 1989; Banscherus et al. 2009) partly were meant to support the enterprises' claims: Through restructuring of rather openly de-signed study programs (in terms of schedule and contents) into more school-like regulated curricula, the expectable knowledge and abilities of the alumni at least became more transparent for the enterprises. Through the implementation of the three-year bachelor-degrees, which substituted the various European study-programs with a provision of a first recognized degree after a minimum duration of four years, university students additionally were meant and encouraged to earlier enter the world of works. In the German speaking countries, the implementation of Bologna was very challenging for the universities, because of their already existing traditional professional apprenticeships: Such apprenticeships, following the

concept of dual education (field-specific theoretical and practical education in schools combined with learning on the job in a particular – usually specialized – enterprise) were exactly designed to prepare the learners for current tasks in the world of works. The result was a rather confusing situation of university students with bachelor-degrees in direct concurrence to apprentices (Dobischat, Fischell, & Rosendahl 2008). What in many cases actually happened during the Bologna-implementation phase in the German speaking countries was that the theoretical knowledge of the prior study programs was compressed and cast into three-year programs on the cost of practical experiences in both scientific work and writing. The reason behind this particular choice was that scientific work routines and methodologies were meant to be taught as preparation for an academic career during the master programs, after the students actually had decided to take such a career path.

However, the general problem Bologna intended to fix was just partly solved. While enterprises were better aware about the supposed abilities of (academic) bachelor degree-holders through the so-called “diploma supplement”, they did not recognize the benefit to employ the more expensive alumni from universities instead of young professionals carrying the Bachelor of Crafts. In fact, the young professionals still were better prepared for current practical work.

As one solution for the problem, the “Institute for Production and Operations Management” at the University of Duisburg-Essen in Germany implemented an extra-curricular study program in the field of Enterprise Resource Planning (ERP). While still providing the long-time established theoretical lectures on general concepts and methodologies within the regular study programs, additional case-study-based online-courses were designed on the world’s leading ERP software, which is the solution of the SAP SE (Columbos 2014).

The first course started in 2006 in German language and exclusively provided to students of the University of Duisburg-Essen (UDE). However, requests from students of other universities in Germany and later on, other countries, convinced us to extend not just the availability of our course but also to expand our course portfolio. While 63 participating students of the UDE registered for the initial course in 2006, over 5.000 students from 110 countries registered for the now available 13 courses in 2015. In order to still being able to manage the tutorial support for this high number of students we thought about changing our modus operandi into a MOOC. However, there were strong reasons against this idea that are being discussed in the following after the program *erp4students* has been introduced in detail.

THE PROGRAM *erp4students*

With the SAP University Alliance as a strong partner at the side, the program *erp4students* was first implemented in 2006. The initial course on “Integrated Business Processes with SAP ERP” (IBP) was initially provided in German language only and exclusively available for students of the University of Duisburg-Essen. A minor study fee was demanded, covering the expenses, especially for the seven days per week tutorial support; *erp4students* generally follows a not-for-profit approach. In the meantime, twelve additional SAP-related courses were implemented and the access was opened for foreign participants. Figure 1 shows the thirteen currently available qualified courses on beginner and advanced level (courses on advanced level presume the knowledge from the courses on beginner-level); most available in German and English and some, additionally, in Spanish and Russian language.

FIGURE 1
THE COURSES CURRENTLY PROVIDED IN THE PROGRAM *erp4students*

Issue	Course Content	Languages
SAP ERP	Integrated Business Processes with SAP ERP (TERP10)	DE, EN, ES, RU
	SAP ERP Customizing I (Beginner)	DE, EN, ES
	SAP ERP Customizing II (Advanced)	DE, EN
	Introduction to Enterprise Resource Planning	EN
SAP BW	SAP BW I (Beginner)	DE, EN, ES
	SAP BW II (Advanced Business Intelligence)	DE, EN
	SAP BO - SAP BusinessObjects and SAP HANA	DE, EN
	Data Warehousing (Beginner)	EN
SAP CRM	SAP CRM (Beginner)	DE, EN
SAP PPS	SAP Productions planning und control I (Beginner)	DE
	SAP Productions planning und control II (Advanced)	DE
ABAP	ABAP I (Beginner)	DE, EN
	ABAP II (Advanced)	DE, EN

Besides providing the relevant theoretical understanding on basics in ERP particularly for participants from fields different than IS or Computer Science, all courses are fully based on practically solving case studies, so that the achievement of generally usable application-related competences can be ensured. The workload of each course is approximately 180 hours – this workload corresponds to six ECTS points (European Credit Transfer System) or four credits (U.S. credit system). After successfully having completed the case studies, the students receive the university certificate. For some courses and to a reduced fee, the students additionally have the opportunity to participate in the official consultant certification exams offered by the SAP SE. Many universities (and enterprises) around the world recognize the university certificates, so that achieved credit points can be transferred to the participants' regular study programs, as far as the curricula generally include self-chosen courses.

MOOCS

Since 2008 (Liyanagunawardena et al. 2013), MOOCs, i.e., Massive Open Online Courses, be-came a widely discussed means to deliver online education. An official definition of the term is not available and Daniel (2012) even spoke of 'the educational buzzword of 2012'. Bendel (2014) defined MOOCs as (translated from German) Internet-based ("Online") courses inviting a large number of learners for participation ("Massive") with access available for everyone, independent of professional, educational, social, cultural, racial, and national background ("Open"). While participating in MOOCs in most cases is free of charge, providers of MOOCs developed business models different to the ones applied in traditional distance education, i.e., taking a fee for additional learning material, 1:1 support, certificates, and examinations (Liyanagunawardena et al. 2015). The most prominent providers of MOOCs are elite institutions like Stanford University, Massachusetts Institute of Technology (MIT), and Harvard University. Admiraal et al. (2015) provide a comprehensive overview about current approaches and offers. Held by internationally prominent researchers of the field, MOOCs easily can reach participant-

numbers above 5.000, but it is unclear if the courses themselves are in the focus of the learners' interests or rather the prominent speakers. However, in the meantime, many universities and institutions implemented and provided MOOCs all over the world. After first experiences, MOOCs turned to a general hype in the E-Learning community, going along with assumptions regarding the potential to constitute the long-searched solution for educational inequality in the world (Rohs & Ganz 2015). Extreme high dropout rates (up to 99 %, see Mathewson 2015), pedagogical and didactical constraints, often perceived cultural issues, a very low rate of participants from third-world countries, language gaps, missing quality criteria and particularly, missing recognition of completed courses (in the sense of accepted credit points) led to critique regarding MOOCs (Daniel 2012, Dillahunt et al. 2014, Hollands & Tirthali 2014, Rohs & Ganz 2015, Schuwer et al. 2015). According to Bulfin et al. (2014), a MOOC should not be declared successful just because many people register in the very beginning, but because learners successfully finish the course and receive a certificate in the end, which generally is recognized for its quality. This particularly includes the necessity for an excellent learning design and context-sensitive support of the learners. In 2001, even before the first MOOC came up, Gorski (2001) expressed that "The 'transformation' in multicultural curriculum transformation refers to the extent of change needed to establish a curriculum free from a blatant reliance on Eurocentric and male-centric perspectives, voices, and worldviews". Experiences from the last years in the context of MOOCs show that this statement easily could be transferred to single courses and particularly, to MOOCs. Deimann et al. (2015) expressed from their experiences with MOOCs at the Fernuniversität Hagen (Germany) that (p.74) related to those learners who eventually completed the courses, they just found non-significant differences between MOOCs and the traditional forms of distance education.

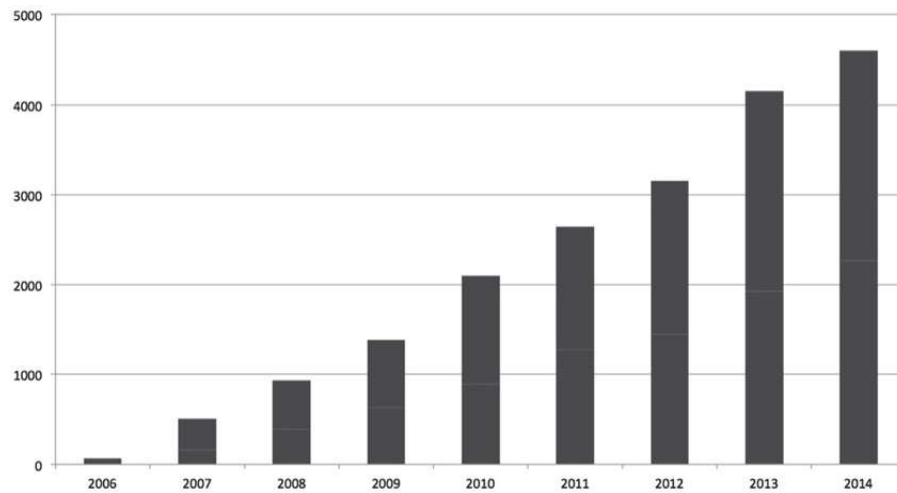
MOOCS IN POM-EDUCATION

MOOC technologies commonly are used in the context of POM Education as a means to provide course contents, manage learning efforts and support learning progress. Amongst others, many course offers deal with very basic issues (introductions) on "Operations Management", "Principles of Management", "Production Management", "Quality Engineering & Management", etc. A reasonable source for related courses is the publicly available "MOOC List" (MOOC List 2016), which is organized and kept update by several large MOOC providers. Specific reports on the applicability of these technologies and related experiences that could explain the frequent adoption of MOOC design approaches particularly in this field are not available. However, the fact that so many offers actually are available indicates that there appears to be a positive result for both, the providers and the participants.

***erp4students*: ADOPTING MOOC DESIGN?**

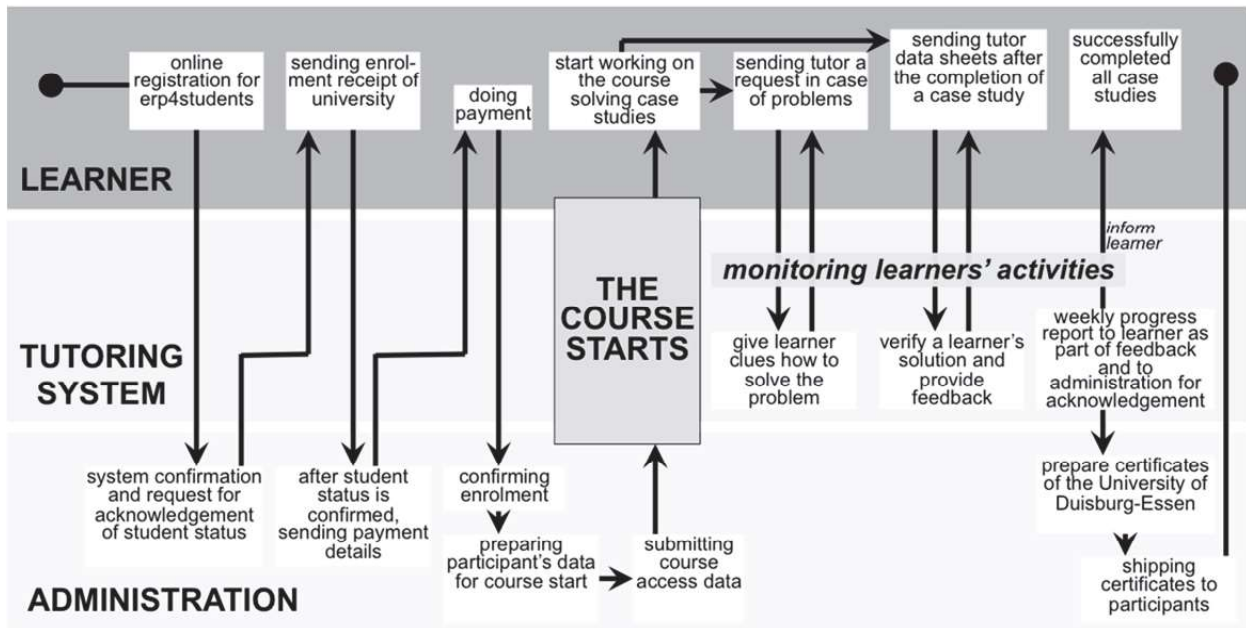
The program *erp4students* underwent quite an impressive development from the initial enrolment of a single course for 63 local students until today. Both the numbers of participants and the regional distribution steadily increased over the course of the years between 2006 and today, 2015. Figure 2 shows the demographic development of registered learners in *erp4students*.

FIGURE 2
THE COURSES CURRENTLY PROVIDED IN THE PROGRAM *erp4students*



With the wider distribution of the program across the world, our membership in the Academy Cube, initialized by the SAP SE, and with the increasing variety of course modules, we expect (in 2011) the so far monitored progress in numbers of participants to be ongoing at least for the next decade. Without adapting internal processes and course design according to the increasing number of participants, managing the learners soon would become a serious challenge. Adopting MOOC-technologies and design was one option to solve the issue. However, as a first step, the case-study-based courses were translated to English language because of requests from international students and students from other countries. Later on, also Spanish and Russian language versions followed. In the current semester, a total of 1245 learners registered alone for the beginners-course „Integrated Business Processes with SAP ERP”; 865 learners for the German language version and 380 learners for other language versions. From the learners registered from EU countries, 167 were international guest students in German universities. In order to decide if the management and maintenance of the courses should be changed to a MOOC-like design, hitherto implemented structures, schedules and technologies had to be analyzed. Figure 3 shows the core-processes in detail as they currently are designed in *erp4students*.

FIGURE 3
THE CORE-PROCESSES IMPLEMENTED IN *erp4students*



We found that such a change would require more automated processes. In the initial design, manpower was demanded for the registration and payment procedure (Administration), the evaluation of results and providing feedback (Tutoring System), the continuous seven days per week support of the learners (regarding technological issues and during the learning process; Tutoring System), and finally, for the granting and delivery of certificates (Tutoring System and Administration). Because of the very individual problems of the learners, be it from technological or maintenance perspective, a full (and exclusive) automation was no option for any of the processes. Eventually, still a real person had to be available to solve such specific issues or else, we would not just lose future learners but also the opportunity to really provide an open offer (inviting all university students to participate regardless of their national origin or field of study). Further on, changing the system towards an increased level of automated processes would include a change of our own, hitherto successfully used and self-maintained technology.

QUALITY MANAGEMENT IN *erp4students*

The Quality Management strategy within *erp4students* follows the recommendations of the German concept “Qualitätsplattform Lernen” (transl.: “quality platform learning”) from Arnold et al. (2013), which describes a holistic approach based on three parts, i.e.: 1., quality of educational offers, 2., basic quality of organizations, and 3., measures for excellent quality in organizations. While MOOCs, so far (Harvard, without year), achieve an average course completion rate of around 8 %, learners who registered at the program *erp4students* successfully finalized their chosen courses with a rate of above 80 %, and in Austria, which had the highest measured completion rate of all countries, even over 90 %. We expect that a central reason for the success of *erp4students* is that quality assessments are conducted on a regular basis, leading to improvements of the current courses in the sense of the learners and to the implementation of new courses.

While most of the implemented QM-instruments, such as the description of processes (transparency) and learning goals, the technical accessibility of the platform and of all course elements, and the consistent logic amongst and across each of the learning units are just maintained once during course

planning and production, a central instrument for ensuring an ongoing high level of quality is a questionnaire, which repeatedly is conducted in the end of each semester with the last generation of learners as evaluators. The students are invited to provide feedback regarding their personal experiences in *erp4students*. For our evaluation if changing the platform and modus operandi of tutorial support significantly would influence the satisfaction level of the learners, some further questions were implemented in the last round.

WHEN LEARNERS CAN CHOOSE

Without repeatedly going too much into detail regarding the Quality Management questionnaire (Richter et al. 2016), we extended our standard questionnaire from QM with a question on possible changes in the system. The answers of the students clearly revealed that additional functionalities of social platforms (which a MOOC-system would provide as special features) would not be perceived as a benefit and that particularly the very individual and timely caretaking through our tutors constitute one of the central success factors of *erp4students*.

CONCLUSION AND NEXT STEPS

erp4students generally shows that extra-occupational content offers can sustainably help to implement the Bologna process and support universities (and students) to offer application-related education without having to give up their very basic claim for sustainability.

The students clearly express their need for such opportunities in general and in particular, the value of *erp4students* to increasing their future job chances. We found that even in a context like Germany and Austria, where university education generally is expected to be free of charge, students are willing to pay manageable prices for personal support, provided that the offers as well as the pricing are considered to be reasonable. In *erp4students* we managed to claim such a reasonable pricing by keeping them lowest possible on a not-for-profit basis. Additionally, the learners in *erp4students* have the chance to experience thorough personal support from their tutors and have a lot of time to spend and experience within the original SAP-developers environment – which they highly value. For the future, we plan to implement further courses, translate existing courses to additional languages, and we aim to involve students from not yet considered regions of the world. We found that changing our concept and design according to MOOC “standards” would neither lead to benefits regarding our courses’ quality, nor would it significantly lower the costs of maintenance. In fact, outsourcing our technological maintenance would mean to shift our current expenses from financing tutorial support to third-party technology providers (including additional LMS-software). This would mean less flexibility for us in case of found quality issues, a high level of dependency from technology providers, and no benefit regarding the actually perceived quality of our courses. In order to steadily go on writing a success story, we plan to further support the learners through human tutors and administrative staff. For the further distribution in other countries, we are going to monitor the cultural perceptions and attitudes of our learners in order to best possible support them with our future course design and particularly, to prevent causing recognized cultural conflicts. First measures regarding the implementation of a more culturally sensible course environment are being taken: As a first step, the Learning Culture Survey (Richter & Adelsberger 2015) is currently being implemented in the context of *erp4students* with the aim to determine culture-related peculiarities regarding expectations towards and perceptions of education. Understanding the expectations and perceptions of learners from different countries allows us to either prepare them for expectable differences to be found in *erp4students* or to adapt *erp4students* accordingly.

The access to *erp4students* is exclusively open for registered university students. Thus, we would like to invite professors and universities around the world to recommend our program to their students and to directly contact us in order to discuss about possible opportunities for cooperative activities. We further on would like to encourage other institutions, groups, and individuals to design similar offers for students, to openly provide access to the international community and to share their experiences.

ACKNOWLEDGEMENTS

We would like to thank our participants and staff for their ongoing support to preserve the high level of quality in *erp4students*. For more information please visit the website of *erp4students* and/or contact us directly. We are happy to help and look forward establishing any kind of cooperation: <http://www.erp4students.eu>

REFERENCES

- Admiraal, W., Huisman, B. & Pilli, O. (2015). Assessment in Massive Open Online Courses. *The Electronic Journal of e-Learning*, 13(4), 207-216.
- Arnold, P., Kilian, L., Thilloßen, A. & Zimmer, G. (2013). *Handbuch E-Learning: Lehren und Lernen mit digitalen Medien*. Third Edition, Bertelsmann Verlag, Bielefeld.
- Banscherus, U., Gulbins, A., Himpele, K. & Staak, S. (2009). *Der Bologna-Prozess zwischen Anspruch und Wirklichkeit: Die europäischen Ziele und ihre Umsetzung in Deutschland*. GEW, Leutheusser Druck, Coburg.
- Bendel, O. (2014). *MOOC, Online im Internet*. In: Springer Gabler Verlag (Ed.), Gabler Wirtschaftslexikon. Available at <http://wirtschaftslexikon.gabler.de/Archiv/688938794/mooc-v4.html>
- Bulfin, S., Pangazio, L. & Selwyn, N. (2014). Making ‘MOOCs’: The Construction of a New Digital Higher Education within News Media Discourse. *International Review of Research in Open and Distributed Learning (IRRODL)*, 15(5). Available at <http://www.irrodl.org/index.php/irrodl/article/view/1856/3117>
- Columbos, L. (2014): *Gartner's ERP Market Share Update shows the Future of Cloud ERP I now*. Available at <http://www.forbes.com/sites/louiscolombus/2014/05/12/gartners-erp-marketshare-update-shows-the-future-of-cloud-erp-is-now/>
- Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media in Education*, 3. Available at <http://www-jime.open.ac.uk/jime/article/viewArticle/2012-18/htm>
- Deimann, M., Lipka, A., & Bastiaens, T. (2015). Strange Bedfellows? What can MOOCs learn from Distance Education? In Bonk, C.J., Lee, M.M., Reeves, T.C., & Reynolds, T.H. (Eds.), *MOOCs and Open Education around the world*, Routledge, NY, 67-77.
- Dillahunt, T., Wang, Z., & Teasley, S.D. (2014). Democratizing Higher Education: Exploring MOOC Use Among Those Who Cannot Afford a Formal Education. *International Review of Research in Open and Distributed Learning (IRRODL)*, 15(5). Available at <http://www.irrodl.org/index.php/irrodl/article/view/1841>
- Dobischat, R., Fischell, M. & Rosendahl, A. (2008). *Auswirkungen der Studienreform durch die Einführung des Bachelorabschlusses auf das Berufsausbildungssystem: Eine Problemskizze*. Hans-Böckler-Stiftung, Düsseldorf.
- Gorski, P. (2001). Multicultural Curriculum and the Web: Transformation and Integration. *Multicultural Perspectives*, 3(1): 43-50.
- Harvard (without year). Harvard University, Available at <http://harvardx.harvard.edu/news/learner-intention>
- Hollands, F.M. & Tirthali, D. (2014). *MOOCs: Expectations and Reality, Full Report*. Center for Benefit-Cost Studies of Education, Teachers College, Columbia University. Available at http://cbcese.org/wordpress/wp-content/uploads/2014/05/MOOCs_Expectations_and_Reality.pdf
- Liyanagunawardena, T.R., Lundqvist, K.O. & Williams, S.A. (2013). MOOCs: A Systematic Study of the Published Literature 2008-2012. *International Review of Research in Open and Distributed Learning (IRRODL)*, 14(3). Available at <http://www.irrodl.org/index.php/irrodl/article/view/1455/2531>

- Liyanagunawardena, T.R., (2015). Massive Open Online Courses and Economic Sustainability. *European Journal of Open, Distance and E-Learning (EURODL)*, 2015/II. Available at <http://www.eurodl.org/?p=current&article=709>
- Mathewson, T.G. (2015). *Under 1% of global freshman academy students eligible for ASU credit*. Web Blog, available at <http://www.educationdive.com/news/under-1-of-global-freshman-academy-students-eligible-for-asu-credit/411241/>
- MOOC List (2016). Available at <https://www.mooc-list.com/?static=true>
- Richter, T., Adelsberger, H.H. (2016). Learners' Cultures in the Context of Education. In: Zvacek, S., Restivo, M.T., Uhomoihi, J. & Helfert, M. (Eds.), *Computer Supported Education*, Springer International Publishing Switzerland, 558-580.
- Richter, T., Adelsberger, H.H., Katami, P., & Katami, T. (2016). *erp4students: Introducing A Best Practice Example for Vocational Training in Universities*. In: *Proceedings of the ERP-Future Conference 2015*, Munich, Germany. Forthcoming in Feb. 2016
- Rohs, M. & Ganz, M. (2015). MOOCs and the claim of education for all: A disillusion by empirical data. *International Review of Research in Open and Distributed Learning (IRRODL)*, 16(6). Available at <http://www.irrodl.org/index.php/irrodl/article/view/2033/3549>
- Schuerer, R., Gil-Jaurena, I., Aydin, C.H., Costello, E., Dalsgaard, C., Brown, M., Jansen, D. & Teixeira, A. (2015). Opportunities and Threats of the MOOC Movement for Higher Education: The European Perspective. *International Review of Research in Open and Distributed Learning (IRRODL)*, 16(6). Available at <http://www.irrodl.org/index.php/irrodl/article/view/2153/3550>
- Sorbonne (1989). *Sorbonne joint declaration*. Available at http://www.bolognaberlin2003.de/pdf/Sorbonne_declaration.pdf

For the printed journal version, please contact:

Dr. Thomas Richter
 Max-Bruch-Strasse 1
 D-53121 Bonn

As for the Journal subscription, Prof. Dr. Heimo H. Adelsberger will register and subscribe for the journal for one year.