174

E.3 Digitalisation in Higher Education: A Flipped Classroom Arrangement to foster Internationalisation

Mattis Altmann[1], Alexander Clauss[1], Anne Jantos[1], Florian Lenk[1],
Samuel Reeb[1], Ali Akbar Safavi[2], Eric Schoop[1]
[1] *Technische Universität Dresden, Chair of Information Management*
[2] *Shiraz University, School of Electrical and Computer Engineering*

Abstract

This practical paper presents a successful international teaching & learning project in Higher Education (HE), which can be used as blue print for similar international HE teaching/learning cooperations. A virtual module, delivering 5 ECTS to participants from Germany and Iran, was organized as flipped classroom (FC), consisting of 2 phases: (1) online phase of 7 weeks, having started at April 12, 2019, with 15 students from Shiraz University, Iran, and 23 students from TU Dresden, Germany, collaborating in mixed teams of 5–6 participants each on a complex business case under tight guidance by qualified learning community managers, and (2) a follow-up on-site meeting at TU Dresden in the first week of July with 3 intensive workshops applying different techniques to consolidate the prior online collaboration results.

1 Background

Virtual Collaborative Learning (VCL): Designed already in 2001 and since further developed in iterative processes, virtual collaborative learning takes place regularly and is tightly integrated in the HE teaching activities at the authors' institution. An international VCL Master module delivers ECTS credits and grades to the participating students, who collaborate in mixed teams of 4–6 participants from at least 2 nations. In self-organized and tightly supervised project work the teams solve ill-structured, authentic business cases and are assessed on their team result, their collaborative processes plus individual activities and role-conformance (Balázs, 2005).

Over the years, the focus concentrated on international collaborations. The students do not only have to demonstrate professional knowledge, but also should develop soft skills like collaboration competencies, social media competencies, foreign (English) language skills and intercultural awareness (Tawileh, 2017, Clauss, Lenk & Schoop, 2019a). Based on findings about the performance of former VCL project teams, but also about individual and social barriers, since 2012 specifically qualified E-Tutors are applied as learning community managers, and the cases to be solved follow the critical-incident method as a special form of problem-based-learning (Clauss, Altmann & Schoop, 2019, Tawileh 2017). Since this year, the supervision

activities and decision making about interventions to guide mis-routed teams or to settle disputes are supported by social learning analytics in forms of an E-Tutor's dashboard (Clauss, Lenk & Schoop 2019b).

Knowledge Transfer Partnership between Technische Universität Dresden and Shiraz University: In 2016, a first memorandum of understanding (MOU) between the two universities was signed, renewed in 12/2018 with the focus on establishing and developing a knowledge transfer partnership in the fields of common research and teaching projects. Regarding E-Learning, the knowledge transfer proceeds in both directions, as e-learning programs in HE in Iran have already been planned since early 2000. The first e-university program was conducted in early 2004 by Shiraz University in one university discipline with about 200 students. Today, about 2000 students are simultaneously studying in Shiraz University's e-learning programs. The programs include 14 Degree Programs such as Bachelor and Master Programs in Electrical Engineering, Computer Science and Engineering, Information Technology, Law, Management, etc. (Safavi 2008). In the last years, a special focus lies on the design and integration of virtual laboratories in Engineering Sciences (Safavi & KavehTalavaki 2013, Safavi & Veisi 2013).

The project reported in this practical paper was the first step towards establishing a common E-Learning approach, following the MOU between both universities. Based on the gained experience, the arrangement shall be fine-tuned and applied in different sciences both for research-oriented learning collaboration on Master level and on collaborative research summer schools on Ph.D. level.

2   Flipped Classroom (FC) Architecture of the Current Project

A FC arrangement typically consists of two phases: (1) individual self-organized online learning to acquire basic knowledge for (2) on-site knowledge consolidation in social interactions and collaborations (e.g. seminars, workshops), as described e.g. in Jantos, Heinz, Schoop & Sonntag (2016).

(1) Knowledge acquisition: In our case, phase (1) consisted of a 7 weeks lasting collaboration in the virtual classroom. Besides providing ECTS credits and grades for the local study programs, this VCL project additionally served to
- get the participating 38 students (15 from Shiraz U., 23 from TU Dresden) acquainted to each other,
- foster their team spirit on a common task (design of a fictive Master course on further management education to be implemented in Shiraz, focusing on the digitalisation of business processes and relying on Digitalisation in HE methods) and

-   build up knowledge on similarities and differences of HE, further management education and vocational training in Germany and in Iran.

For this 61. VCL project, the case was carefully designed not only to match the VCL requirements on didactical, organizational and technical level, but also to provide deep background knowledge for phase (2) of the FC arrangement.

(2) Knowledge consolidation: Thanks to funding by DAAD[1], complemented by the flexible funds of TU Dresden[2], 12 Shiraz students and their supervising lecturer could travel to Dresden and participate commonly with their German peers from the former VCL project in four on-site workshops. These workshops and the accompanying program with several visits of TU Dresden institutions and Dresden City exhibitions and additional social events served to

-   substantiate the collaboratively developed concepts of the virtual phase,
-   deepen the already existing virtual relations between the team members, and
-   foster the understanding of the European social and HE culture.

The workshops in phase (2) stepwise detailed the concepts of the virtual phase (1). Here, the participating Iranian and German students (and some also participating ERASMUS students from Eastern Europe) experienced different warm-up and moderation techniques. Thereby, they could reflect on the passed VCL project and deepen their understanding of on-site collaboration methods, being relevant for their research-oriented studies and their future professional work:

1. KickOff – Task: find key factors of the so far developed concepts – Method: Building clusters of arguments
2. Workshop 1 – Task: discussion of the key "regulating screws" of a VCL (professionalized pedagogical support concepts, authentic cases and tasks and the technical platform and functionality) – Method: Focus group interview
3. Workshop 2 – Task: identification of indicators for successful virtual collaboration and their operationalization in the case study design – Method: World café
4. Workshop 3 – Task: differentiation between summative and formative assessments, analysis of the potentials of Learning Analytics to support assessment and gamification elements – Method: Central point game, brain storming.

3   Conclusion and Outlook

The project presented got enthusiastic feedback from all participants and is seen as a value added for both universities. Its scientific evaluation will be topic of coming research publications. On the practical side, to further underpin the MOU between both universities, common virtual collaborative learning projects shall be repeated

in future and also applied to other items of the MOU (e.g. common research). Therefore, we see our FC arrangement as a blue print for joint activities to foster Internationalisation of Higher Education by means of Digitalisation.

References

Balázs, I. E. (2005). "Konzeption von Virtual Collaborative Learning Projekten: Ein Vorgehen zur systematischen Entscheidungsfindung", Dissertation, Technische Universität Dresden, 2005.

Clauss, A., Altmann, M., Schoop, E. (2019). "How to Design Case Studies to Foster Virtual Collaboration", Proceedings of the 2nd Iranian international and 13th national Conference on Quality Assessment in University Systems (QUAS–2019), Shiraz, Iran.

Clauss, A., Lenk, F., Schoop, E. (2019a), "Digitalisation and Internationalisation of Learning Processes in Higher Education: A best practices report", Proceedings of the 13th Iranian and 7th International Conference on e-Learning and e-Teaching (ICELET 2019), Tehran, Iran.

Clauss, A., Lenk, F., Schoop, E. (2019b). "Enhancing international virtual collaborative learning with social learning analytics", Proceedings of the 2nd International Conference on New Trends in Computing Sciences (ICTCS 2019), Amman, Jordan, accepted – in press.

Jantos, A., Heinz, M., Schoop, E., Sonntag, R. (2016). Creating a Scalable Flipped Classroom Arrangement to Enable Part Time Studies to Further Human Development and Management Education", Proceedings of the International Conference "New Challenges of Economic and Business Development – 2016: Society, Innovations and Collaborative Economy", Riga, Latvia, pp. 289–299.

Safavi, A. A. (2008). "Developing Countries and e-Learning Program Development", Journal of Global Information Technology Management, Vol. 11, No. 3, pp. 47–65.

Safavi, A. A., KavehTalavaki, A. (2013). "Developing a Conceptual Model for Establishing Virtual Laboratories", (IEEE Xplore), Proceeding of ICELET 2013, Shiraz, Iran.

Safavi, A. A., Veisi, P. (2013). "A Remote and Virtual PLC's Laboratory via Smartphones", (IEEE Xplore), Proceeding of ICELET 2013, Shiraz, Iran.

Tawileh, W. (2017). "Design Principles for International Virtual Collaborative Learning Environments Based on Cases from Jordan and Palestine", Dissertation, Technische Universität Dresden, 2017.