Université de Strasbourg

Laboratoire interuniversitaire des sciences de l'éducation et de la communication | LISEC

Education & Technology

Gamification, Artificial Intelligence and support to motivation

Programme of the 13th E&T Autumn School

October 21-27, 2020. Strasbourg, France

Edited by: D. Dufort, D. Adinda, C. Yagoubi, P. Marquet

Table of Contents

Organisation Committee

Dina Adinda.....University of Strasbourg
Diane Dufort.....University of Strasbourg
Pascal Marquet.....University of Strasbourg
Najoua Mohib.....University of Strasbourg
Francine Sarrazin.....University of Strasbourg
Caroline Volzke.....University of Strasbourg
Chayma Yagoubi.....University of Strasbourg

Scientific Committee

Daniel Apollon.....University of Bergen
Myriam Coco.....University of Bergen
Thomas Köhler.....Dresden University of Technology
Pascal Marquet.....University of Strasbourg
Najoua Mohib.....University of Strasbourg
Thomas Schöftner.....Private University of Education, Diocese Linz
Petra Traxler.....Private University of Education, Diocese Linz
Bruri Triyono.....Graduate School Yogyakarta State University

Venue

INSPÉ - Faculty of education and lifelong learning of the University of Strasbourg
141 avenue de Colmar 67100 Strasbourg - room “Salle des conseils”
Krimmeri-Meinau stop - tram lines A & E

Education & Technology 2020 draft programme

	Tue 20.10.	Wed 21.10.	Thu 22.10.	Fri 23.10.	Sat 24.10.	Sun 25.10.	Mon 26.10.	Tue 27.10.	Wed 28.10.
09.00 10.30	Travel from home cities/ institutions	**Late arrivals and registration**	**Key Note 2** (Erica De Vries – on site)	**Key Note 4** (Peter Döppler – on site)	**Travel to Gérardmer by bus**	**Hiking & discussing**	**Key Note 6** (Thomas Köhler – on site)	**Key Note 8** (Daniel Apollon – remote)	Travel to home cities/ institutions
11.00 12.30		**Welcome speeches and presentation of the E&T 2020 Programme**	**Blended parallel workshop 1** PhD students' presentations (Pascal Marquet/Dina Adinda)	**Blended parallel workshop 3** PhD students' presentations (Thomas Schöftner/Petra Traxler)	**Arrival and Check-in at Hotel Beau Rivage**		**Blended parallel workshop 4** PhD students' presentations (Thomas Köhler/Pascal Marquet – on site)	**Poster session**	
12.30 13.30		**Lunch**	**Lunch**	**Lunch**	**Lunch at the hotel**	**Lunch at the hotel**	**Lunch**	**Lunch**	
13.30 15.00		**Key Note 1** (Helge Fischer - remote)	**Key Note 3** (Eric Schoop – on site)	**Key Note 5** (Myriam Coco – remote)	**Hiking & discussing**	**Preparation of posters / free time**	**Key Note 7** (Bruri Triyono - remote)	**Evaluation session**	
15.30 17.00		**Group work** Finalisation of PhD students' presentations	**Blended parallel workshop 2** PhD students' presentations (Diane Dufort/Maria Denami)	**Training session 1** (Dina Adinda – Presenting a poster)		**Travel to Strasbourg by bus**	**Visit of the European Parliament**	**Check-out & departures**	
17.00 22.00	**Arrivals & Check-in**	**Guided boat tour or free time (18:45)**	**Welcome dinner**	**Historical museum of the City of Strasbourg**	**Dinner at the hotel**		**Free time**	**Travel to home cities/ institutions**	

Programme of the 13th E&T Autumn School

& Education Technology

Abstracts of teachers and invited speakers

About “Learning” in Artificial Intelligence

Daniel Apollon, University of Bergen

The relatively short history of Artificial Intelligence (AI) witnesses an eventful quest for emulating and, in its most ambitious and utopian versions, even surpassing human abilities. For about seven decades, the field of AI has been a succession of roller coaster rides, during which overambitious expectations, e.g., about general-purpose intelligence, have been followed by periods of disillusionment, and techniques that were relegated as blind alleys have been revived.

As a computer science discipline, AI has relied on various notions and representations within social sciences and humanities about, e.g., “intelligence”, “consciousness”, “knowledge”, “representations”, and “learning”. As well, as stated by Margaret A. Boden, “*the results of Artificial Intelligence have been invaluable to biologists, psychologists, and linguists in helping to understand the processes of memory, learning, and language from a fresh angle.*”

This keynote, will offer a concise introduction to various approaches to uses of various notions of “learning” in AI, with particular attention given to highlighting the contrast between early general-purpose Artificial Intelligence (general problem solvers) and the most recent techniques, e.g., “Deep Learning”.

Keywords : Artificial Intelligence; Deep Learning; learning algorithms; general intelligence; supervised, unsupervised, and reinforcement learning.

References

Boden, M. A. (2018). *Artificial Intelligence : A Very Short Introduction*. Oxford University Press. Oxford. https://books.google.fr/books?id=mB5pDwAAQBAJ

Frankish, K., & Ramsey, W. M. (2014). *The Cambridge Handbook of Artificial Intelligence.* Cambridge University Press.

Rockwell, A. (2017, August 28). The History of Artificial Intelligence [Blog]. *Special Edition on Artificial Intelligence*. http://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/

Sejnowski, T. J. (2018). *The Deep Learning Revolution*. The MIT Press.

Digital Games and Foreign Language Didactics

Myriam Coco, University of Bergen

Games in their analogue forms have to some degree always been a part of language classrooms for various purposes (i.e. adding variation, learning vocabulary, helping simulate situations). However, the same cannot be said about digital games. While they already take a significant place in most students' lives outside learning institutions, their presence in language classrooms remains sporadic. So is the documentation of their concrete use in teaching practices (deHaan 2020).

This paper will explore the extent to which digital games can be beneficial to foreign language learning in (Norwegian) schools, and the consequential implications for foreign language didactics.

References

deHaan, J. (2020). Game-based language teaching is vaporware (Part 1 of 2): Examination of research reports. *Ludic Language Pedagogy (2)*, p. 115 of 139

Decoratives, controls and squiggles: Seeing the forest for the trees

Erica de Vries, University of Grenoble-Alpes

The design of educational games, and more generally the design of interactive learning environments, involves developing, selecting and organising a variety of different media. Multiple design principles for multimedia learning prescribe the temporal and spatial composition of text and pictures, audio and visual media, as well as static and dynamic visualizations. Furthermore, the use of modelling, simulation and visualization techniques in scientific and technical domains has led to the co-existence of a variety of graphical formalisms, representational formats, and dynamic visualizations (De Vries, 2010). In this keynote, I propose an inquiry into the following thought experiment: Imagine the learner of the future equipped with a collection of multiple interactive learning environments for school, work and training. As a user of these environments, the learner reads, browses, links, models, simulates, and discusses, by swift insightful interpretation and construction of so-called external representations, such as texts, pictures, graphs, and diagrams (Ainsworth, 2006; De Vries, 2011). The learner also recognizes meaningful inscriptions, symbols, letters, and graphics, from inscriptions that make the environment attractive and motivating. Finally, the learner knows, by the special look and feel of each interface, when to take inscriptions literally, figuratively, or diagrammatically. The question then arises: How does the learner distinguish the core content amidst decoratives, controls, and squiggles? I propose to reflect on this issue through a theoretical inquiry into the role of convention as explored by Lewis (1969). More specifically, I will formulate and discuss two opposing viewpoints, i.e. that multiple conventions are beneficial, or on the contrary, detrimental to learning.

References

Ainsworth, S. (2006). DeFT: A conceptual framework for considering learning with multiple representations. *Learning and Instruction, 16*(3), 183-198. https://doi.org/10.1016/j.learninstruc.2006.03.001

De Vries E. (2010). Convention, ou le partage de l'arbitraire. Dans J. Baillé (Ed.), *Du mot au concept : Convention* (pp. 113-134). Presses Universitaires de Grenoble.

De Vries, E. (2011). Learning with external representations. In N. M. Seel (Ed.), *Encyclopedia of the Sciences of Learning* (pp. 2016–2019). Springer Science & Business Media.

Lewis, D. K. (1969). *Convention: A philosophical study.* Harvard University Press.

Back from Mars – a practical approach to game based learning

Peter Döppler, WITTENSTEIN SE

Company employees have different attitudes towards change and further professional training. Often, a low level of extrinsic or intrinsic motivation leads employees to completing learning content in an unsustainable manner. This can be avoided by involving them and thus supporting the learning process. Game-based learning (GbL) was chosen as a method of imparting knowledge as part of an organizational project aimed at restructuring and redesigning the global product development process. GbL is a basic principle that defines learning goals and uses games to support the teaching and learning process (acc. Jacob & Teuteberg, 2017, p.98). Gamification, on the other hand, is the basic principle of integrating playful elements into everyday situations. A serious game is the implementation of both principles and focuses on the acquisition of skills that can be used in real situations (acc. Deterding et al., 2011, p.11). As an extension of the employees' learning plan, a serious game was finally designed for further training. It should allow employees to experience the processes outside of their everyday work. With the help of a motivation design approach, the intrinsic motivation is to be increased and a reflexive learning process for the development of competencies is promoted. An isolated environment offers employees the opportunity to get to know the new, changed process holistically and to exchange ideas on an interdisciplinary basis. The keynote presents the background, the creation and the implementation of this serious game.

References

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness : Defining « Gamification ». In *MindTrek '11 Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, Tampere, Finland, September 28 - 30, 2011, New York, NY: ACM, p. 9–15. https://doi.org/10.1145/2181037.2181040

Jacob, A., & Teuteberg, F. (2017). Game-Based Learning, Serious Games, Business Games und Gamification–Lernförderliche Anwendungsszenarien, gewonnene Erkenntnisse und Handlungsempfehlungen. In S. Strahringer & C. Leyh (Éds.), *Gamification und Serious Games: Grundlagen, Vorgehen und Anwendungen* (p. 97–112). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-16742-4_8

Beyond Badges and Leaderboards! Concepts and Challenges of Gamification in Education

Helge Fischer, Dresden University of Technology

The concept of gamification was first coined in the marketing area, for example to influence purchasing decisions (Huotari & Hamari, 2012). But today Gamification is a trend in digital education, which is primarily aimed at making classroom situations game-like in order to promote positive emotions and learning motivation (Fischer et al., 2017). Gamification is generally "[…] the use of game design elements in non-game contexts" (Deterding et al., 2011), and very often associated with elements like point, badges or leaderboards. But beyond this there is much more…!

The keynote will provide an overview of gamification in education and anchor it in the context of digitalization. The interface between gaming and learning is highlighted and current concepts such as game based learning, playful learning, gamification and serious games are compared and illustrated using practical examples. Theories and studies from the field of psychology and education are introduced, which help to classify the potentials and risks of gamification and to identify open research questions.

References

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From Game Design Elements to Gamefulness : Defining « Gamification ». In *MindTrek '11 Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, Tampere, Finland, September 28 - 30, 2011, New York, NY: ACM, p. 9–15. https://doi.org/10.1145/2181037.2181040

Fischer, H., Heinz, M., Schlenker, L., Münster, S., Follert, F., & Köhler, T. (2017). Die Gamifizierung der Hochschullehre – Potenziale und Herausforderungen. In S. Strahringer & C. Leyh (Éds.), *Gamification und Serious Games : Grundlagen, Vorgehen und Anwendungen.* Edition HMD (p. 113–125). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-16742-4_9

Huotari, K., & Hamari, J. (2012). Defining gamification : A service marketing perspective. In.*MindTrek '12. Proceeding of the 16th international academic MindTrek conference*, Tampere, Finland, October 03 - 05, 2012, New York, NY: ACM, p. 17–22.

Differences matter. How to identify inclusive, open and participative practices of innovation

Thomas Köhler, Dresden University of Technology

In an international Chinese – German workshop the author recently investigated the inclusive potential of educational media technology, based upon a review of recent approaches in informal, formal and continuous education (Köhler et al. 2020). Based upon that empirical investigation it is intended to identify and discuss inclusive, open and participative practices of innovation, which is in line with the observation that digitization does strengthen the users influence on a knowledge related process (Marquet & Köhler, 2017).

Indeed, participatory media was considered as a conceptual approach in both pedagogy and research before (cf. for example Köhler & Neumann, 2011; Mohamed & Köhler, 2014). Yet, only the huge digital shift did both call for immediate reaction but as well trigger and hinder practice of collaboration. By that, an innovation potential has been set free, especially at the interface between technologies enhancing learning, teaching and research.

Thus, the author calls for approaches that reflect the ongoing development of computer technologies and respective technological approaches and discuss its inclusive, open and participative practices of innovation. There will be a special attention given to international, even global comparative approaches of how educational media technology is applied in an inclusive way, which fit the education and technology research and training network especially.

References

Koehler, T., Lucke, U., & Zhang, X. (2020). Educational media technology and its inclusive potential. A multidisciplinary review of recent approaches in informal, formal and continuous education. Conference: 18. DeLFI Conference on Educational Technologies, Heidelberg, Germany. https://www.researchgate.net/publication/342232846_Educational_media_technology_and_its_inclusive_potential_A_multidisciplinary_review_of_recent_approaches_in_informal_formal_and_continuous_education

Köhler, T., & Neumann, J. (Éds.). (2011). Wissensgemeinschaften. Digitale Medien – Öffnung und Offenheit in Forschung und Lehre. Medien in der Wissenschaft, Band 60; Münster, Waxmann. https://www.waxmann.com/index.php?eID=download&buchnr=2545

Marquet, P., & Köhler, T. (2017). The Empowerment of Users: Rethinking Educational Practice Online. In F. M. Dobrick, J. Fischer, & L. M. Hagen (Éds.), Research Ethics in the Digital Age : Ethics for the Social Sciences and Humanities in Times of Mediatization and Digitization (p. 69–86). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-12909-5_6

Mohamed, B., & Köhler, T. (2014). Web 2.0-based learning. A pedagogical model of participatory media in e-research. In H. Fischer & T. Köhler (Éds.), Postgraduale Bildung mit digitalen Medien. Fallbeispiele aus den sächsischen Hochschulen (p. 227 233). Medien in der Wissenschaft, Band 65; Waxmann. https://www.waxmann.com/index.php?eID=download&buchnr=2993

How to integrate educational and analytical perspectives on collaborative online learning: Reflection on 20 years of virtual collaborative learning (VCL) in Higher Education

Eric Schoop, Dresden University of Technology

Objective:
The role of Social Learning Analytics to support both

- tele-tutoring of collaborative learning teams and
- opening our framework for gamification elements.

Background:
Wirtschaftsinformatik (Business Information Systems Engineering) with an application-oriented approach following the Design Science Research Model

Abstract:
Basis of the presentation is our framework VCL (virtual collaborative learning), well established in the last 20 years of Master education at TU Dresden, Faculty of Business and Economics. VCL modules provide virtual mobility to international, mostly interdisciplinary mixed learners' teams from different countries and universities. Students collaborate on complex cases with open solutions over 6-8 weeks and gain 5 ECTS in conformity to their local examination orders.

A VCL module integrates pedagogical, (information) technical and business perspectives. The framework behind consists of 4 core elements which are in the focus of different Ph.D. research projects at the chair of the speaker:

- Professional pedagogical support concepts (qualification of E-tutors)
- Realistic cases and working tasks (connected to task-specific tools)
- A closed, collaborative technical platform (MS Teams)
- Learning analytics and information visualization.

The presentation focuses on the potential support of E-tutors by learning analytics, informing via dashboards. This information will stepwise also be used to inform the learners about their progress and performance, thus providing a gamified learning environment.

Expectation:
I hope to share different experiences in design, implementation and evaluation of complex blended learning settings, gain insight into different approaches and get ideas useful for our future research.

Gamification Topic On Students' Final Task in UNY Postgraduate Year 2015-2020"

M. Bruri Triyono, Universitas Negeri Yogyakarta

The development of educational technology that utilizes gamification at the primary school to tertiary level is starting to be widely used. Unlike other learning designs, gamification instructional designs will look more fun, interesting and effective. These three aspects will stimulate and increase the motivation of learners to enjoy and focus more on continuous learning, meaning that it does not stop when the learning session is over.

In accordance with the use of digital in instructional design, it has brought educational institutions to carry out trials and use gamification products as a complement to other instructional designs. On the other hand, research activities related to gamification are still rarely carried out, so the success of learning as the impact of gamification has not been widely revealed. Through a simple investigation of the thesis and dissertation topics taken by students as a final assignment for master and PhD study at the UNY Postgraduate Program, it will be revealed how much students are interested in the problem of developing a gamification instructional design.

The results of the investigation showed that there were 0.6% or 30 students who took gamification topics during the years 2015-2020. Most of the topics (53%) revealed the feasibility aspect of using gamification and 90% topics revealed the impact of gamification on learning outcomes, meaning that gamification is only used as a complement to learning media that is in accordance with the learning objectives of the subject. There are still very few topics that reveal students' abilities and generate student enjoyment and involvement in learning. There are 13% topics revealed the motivation aspect, 3% creativity aspect and 6% communication skills aspect. It shows that students' interest in researching gamification problems is still lack, even though in the digital era in various fields of education including daily life, the use of gamification designs is very clearly needed.

Keywords : Gamification, Instructional design, Students' final task

References

Alsawaier, R. (2017). The Effect of Gamification on Motivation and Engagement. *International Journal of Information and Learning Technology*, *35*, 00 00. https://doi.org/10.1108/IJILT-02-2017-0009

Dichev, C., & Dicheva, D. (2017). Gamifying education: What is known, what is believed and what remains uncertain: A critical review. *International Journal of Educational Technology in Higher Education, 14*(1), 9. https://doi.org/10.1186/s41239-017-0042-5

Nurjanah, S., & Triyono, M. (2020). *Game-Based Learning as Media Utilization for Student Feedback in Japanese Kanji Learning.* https://doi.org/10.2991/assehr.k.200521.038

Zaric, N., & Scepanovic, S. (2018). *Gamification of e-learning based on learning styles –design model and implementation.*

Programme of the 13th E&T Autumn School

& Education Technology

Abstracts of PhD Students and Post-Docs

Coaches' mentoring roles and students' self-efficacy beliefs

Dina Adinda, University of Strasbourg

The experience of successful performance has been related to a raised self-efficacy belief within an individual (Kienzler and Fontanesi, 2017). According to Smith (2002) cited in Masson and Fenouillet (2013), this latter is also related to one's motivation. Scientific literature suggests that students' behaviours, intentions, and beliefs in learning are being influenced by various factors that include the learning environment (Ponton and Carr, 2012), in which the coaches or lecturers transmit the pedagogical knowledge and mentor them to learn. A mentoring activity refers to a relationship of trust, discussions, encouragement (Garvey, 1994), and the relational dimension of a helping and coaching activity (Pudelko, 2019). It also represents an attentive presence to others, solicitude, and respect for the other person, and dialogue (Quintin, 2011). In this research, a typology of roles presented in the framework of the mentoring strategies suggested by Adinda (2020) is adopted to understand various mentoring roles in an academic context. This typology agrees that every mentoring role is a representation of the coaches' behaviours associated with their posture that can be seen through their actions. Indeed, each role represents a specific act and may impact learning experience differently. From the theoretical point of view, the role of the Activator and Observator are taken when coaches adopt a supportive mentoring posture. As the Activator, the Observator also aims at the intrinsic regulation of one's action. Besides, this latter also targets an individual's self-direction. Since Carré (2010) highlights that self-efficacy belief is a part of self-direction's constitutive elements, it can be hypothesized that the adoption of these two roles also enhances students' self-efficacy. With this comes the question: Do Activators and Observator mentoring roles enhance students' self-efficacy beliefs?

This work aims to study mentoring roles taken by coaches to assist students in a blended hackathon organized by the EIT Digital Master School. It also aims to seek students' perspectives of the adopted mentoring roles and identify if there is any improvement in their self-efficacy belief in the academic context. The participants of this work include 75 students assigned in the event and 7 coaches. This study uses a mixed-methods design that combines both quantitative and qualitative approaches. Coaches' perspectives on their mentoring roles are identified through an online questionnaire describing how they help the transfer of knowledge, how they interact with students and endorse their self-efficacy beliefs. They are also invited to answer an open-ended question related to these aspects. Semi-directive interviews are managed to gather students' points of view. To measure students' self-efficacy beliefs, the Academic self-efficacy scale (Kim and Park, 2000) is used. This scale consisted of three subscales: task-difficulty preference, self-confidence, and self-regulatory efficacy.

The findings show that coaches are more likely to adopt the supportive posture of mentoring, which allow them to implement the role of Activator when they are proactive in their interventions, and the role of Observer when they are reactive in helping their students. The semi-directive interviews with students confirm these findings, it is also pointed out that they appreciate and prefer being assisted with these roles. According to the survey, it is also noted that students' self-efficacy in academic context have been increased (p-value <.10). Literature suggests that hackathons provide, in general, an active learning experience, and can be a way to improve participants' motivation

(Gréselle-Zaïbet et al., 2018) by instilling, among others, participants' self-efficacy beliefs through achievements (Granados and Pareja-Zastaway, 2019). This research shows that the active learning experience of the studied hackathon is supported by supportive mentoring roles that successfully stimulate students' self-efficacy. Taking into consideration the mentoring roles adopted by coaches, this research confirms that the learning environment has indeed an influence on students' beliefs in learning. Along with this finding, students also highlight some other positive effects of coaches' roles and the blended hackathon to the development of their initiative, innovative, creative thinking, as well as their proficiency in teamwork.

Keywords : Self-efficacy, mentoring, hackathon, higher education

References

Adinda, D. (2020). *Stratégies d'accompagnement des étudiants en formations hybrides : Effets sur l'autodirection dans l'apprentissage* [Doctoral dissertation, University of Strasbourg].

Carré, P. (2010). L'autodirection des apprentissages. Dans P. Carré, A. Moisan, D. Poisson (dir.), *L'autoformation, perspectives de recherche* (1e éd, p. 117-169). Presses Universitaires de France.

Garvey, B. (1994). Ancient Greece, MBAs, the health service, and Georg: Part 1. *Education + Training, 36*(2), 18-24. https://doi.org/10.1108/00400919410058090

Gréselle-Zaïbet, O., Kleber, A. and Dejoux, C. (2018). Le hackathon en mode Design Thinking ou quelles modalités pour former à des compétences méthodologiques et comportementales ? *Management & Avenir, 104*(6), 149. https://doi.org/10.3917/mav.104.0149

Granados, C. and Pareja-Eastaway, M. (2019). How do collaborative practices contribute to innovation in large organisations? The case of hackathons. *Innovation, 21*(4), 487 505. https://doi.org/10.1080/14479338.2019.1585190

Kienzler, H. and Fontanesi, C. (2017). Learning through inquiry : A Global Health Hackathon. *Teaching in Higher Education, 22*(2), 129 142. https://doi.org/10.1080/13562517.2016.1221805

Kim, A. and Park, I.-Y. (2000). Hierarchical Structure of Self-Efficacy in Terms of Generality Levels and its Relations to Academic Performance : General, Academic, Domain-specific, and Subject-Specific Self-Efficacy. *The Annual Meeting of the American Educational Research Association*, Louisiana.

Masson, J. and Fenouillet, F. (2013). Relation entre sentiment d'efficacité personnelle et résultats scolaires à l'école primaire : Construction et validation d'une échelle. *Enfance, 2013*(04), 374 392. https://doi.org/10.4074/S0013754513004047

Ponton, M.-K. and Carr, P. B. (2012). Autonomous learning and triadic reciprocal causation : A theoretical discussion. *International Journal of Self-Directed Learning, 9*(1), 1 10.

Pudelko, B. (2019). La recherche sur l'encadrement à distance en enseignement supérieur, perspectives francophone et anglophone (1974-2016). *Distances et médiations des savoirs,* 25. https://journals.openedition.org/dms/3401

Quintin, J.-J. (2011). L'efficacité des modalités d'intervention tutorale et leurs effets sur le climat socio-relationnel des groupes restreints. Dans B. De Lièvre, C. Depover, A. Jaillet, D. Peraya, and J.-J. Quintin (dir.), *Le tutorat en formation à distance* (p. 61 86). De Boeck

Deficient feedback engagement in E-learning - reasons and measures

Mattis Altmann, Dresden University of Technology

Formative feedback is a crucial criterion for the success of collaborative online teaching and learning arrangements. In some cases, the reality of university teaching reveals a clear paradox in this respect: although it is vehemently demanded, formative feedback from teachers in virtual space is often criticized by students and perceived as inadequate or is simply ignored. The creation of formative feedback in collaborative online arrangements typically involves a great effort for the teachers. This is due to high demands on objectivity, proximity to actions and continuity, as well as on the constructive demonstration of change potential. Not accepting feedback is therefore particularly sobering for teachers.

In addition to the quality of the feedback comments, the way students deal with the comments received is just as crucial. The importance of closing the feedback loop is not a new insight, but the processes of giving, taking, and closing feedback reaches new dimensions in virtual space and especially in collaborative arrangements, which have not yet been comprehensively and systematically addressed. According to the design science research framework of Alturki, Gable & Bandara (2011) this research starts from a relevance perspective. Therefore, this thesis focuses on the following research questions:

RQ1: "Which factors can increase the engagement of students with received feedback in virtual group work activities?

RQ2: "Which design recommendations for enhancing student engagement in terms of feedback can be derived for future modules?

To answer the research questions, the module "Collaboration in the Virtual Classroom" served as the object of investigation, which can be assigned to the established VCL concept, which transfers learning in small groups into virtual space. The participants work in groups with fixed roles throughout the semester. During this process, they have to solve complex tasks over several stages for which there is no concrete solution. The case study work is characterized by a high degree of self-responsibility within the student groups and is intended to convey both formal and informal learning objectives.

In a 3-step interview process, the project managers of the four groups were interviewed at the beginning, in the middle and at the end of the Virtual Collaborative Learning arrangement in order to map the perception in the individual phases. Subsequently, the interviews were evaluated according to the qualitative content analysis based on Mayring (2014). A further dimension can be opened up by analyzing 14 written reflections from participants of the same course who also completed the module. The four project managers who had already participated in the interviews described above were also represented within this group.

The evaluation of the questionnaires and reflections showed that especially at the beginning of the virtual collaboration a more intensive feedback by the e-tutors, as well as the increased encouragement for group-internal feedback by the e-tutors was perceived

as beneficial by the respondents. Most participants were satisfied with the written form of the feedback submission, but there was a lack of timely feedback, which should ideally be given by a professionally qualified teacher shortly after the performance was written. The integration of automated, content-based feedback was rejected by the majority of participants. However, automatic feedback on submissions and status reports were often considered beneficial. In a next step the engagement within feedback activities of students has to be examined further

References

Ajjawi, R., & Boud, D. (2017). Researching feedback dialogue: An interactional analysis approach. *Assessment & Evaluation in Higher Education*, 42(2), 252–265. https://doi.org/10.1080/02602938.2015.1102863

Alturki, A., Gable, G. G., & Bandara, W. (2011). A Design Science Research Roadmap. In H. Jain, A. P. Sinha, & P. Vitharana (Hrsg.), *Service-Oriented Perspectives in Design Science Research* (Bd. 6629, S. 107–123). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-20633-7_8

Guasch, T., Espasa, A., & Martinez-Melo, M. (2019). The art of questioning in online learning environments: The potentialities of feedback in writing. Assessment & *Evaluation in Higher Education,* 44(1), 111–123. https://doi.org/10.1080/02602938.2018.1479373

Jödicke, C., Bukvova, H., & Schoop, E. (2014). Virtual-Collaborative-Learning-Projekte – Der Transfer des Gruppenlernens in den virtuellen Klassenraum. In H. Fischer & T. Köhler (Hrsg.), *Postgraduale Bildung mit digitalen Medien Fallbeispiele aus den sächsischen Hochschulen*. Waxmann.

Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* / (12., überarb. Aufl.). Beltz,. https://katalogbeta.slub-dresden.de/id/0-667717145/

Digitalization in the Bolivian schools

Silvia Blass, Dresden University of Technology

To improve the quality of teaching, many governments around the world have begun implementing extensive programs aimed at supporting teachers in their efforts to employ information and communication technologies (ICTs) to facilitate the digitalization in the schools. However, many of the governments in Latin America implement measure oriented to digitalization in the school as propaganda or political change without making an evaluation of the impact of the investment made in programs and projects aimed for this purpose (Betemi Rawlins, 2018).

Bolivia is one of the Latin American countries that has made the most investment since 2012, especially to guarantee technological access for students and teachers with programs such as "One computer per teacher" "One computer per child" and the creation of a specialized entity for the training of teachers in the use of ICTs in the classroom (UNEFCO).

Research question

Educational measures for the introduction of ICTs in the classroom in Bolivia are mainly aimed at teachers. The following are the research questions.

- What are the attitudes and beliefs of Bolivian teachers towards the use of ICTs in their personal lives and in the workplace?
- What is the effectiveness of teacher training in the use of ICTs in the classroom and which factors influence it?
- To what extent do the teachers apply the acquired media, knowledge and skills through governmental programs to the teaching practice?

Theoretical approach

Among many empirical studies, there is research on teachers' attitudes and acceptance of ICTs in education (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012). Most of them focus on the investigation of the affective and behavioral components of attitudes (Njiku, Maniraho & Mutarutinya, 2019), the abstraction models focus on the feelings and emotions caused by using ICTs through the evaluation of statements based on the subjective experience of the teacher using certain markers (e.g., "I like it", "I enjoy it", "it bores me", "I trust it", "it provokes anxiety", "it generates stress").

However, most studies do not consider the bipolar nature of attitudes since an attitude can be positive or negative, favorable or unfavorable. (Altmann, 2008, p. 146). These studies neither contemplate the normative or social components of attitudes, such as the social acceptance of ICTs or if they fit the moral values and beliefs of the teacher's society, which are relevant according to theories of changing attitudes and behavior (Wood, 2000).

In this research, the effectiveness of teacher training in terms of transfer in the classroom is evaluated. Because most of the ICT training courses in the classroom were created as virtual courses on a Moodle-based system, a case search was carried out to measure the effectiveness of an educational measure based on online courses on the work environment. After exploring various theoretical models for effectiveness abstraction, DeLone and McLean's IS model was chosen as a theoretical reference (DeLone, McLean, 2003)

Methodology

For the present investigation, first a literary study and analysis of the documentation provided by the Bolivian Ministry of Education was carried out, to choose the basic theories and the factors to be studied. Then a differentiated quantitative empirical study of attitudes was carried out (Richter, Naumann & Groeben, 2000) to understand and answer the first and third research questions. The instrument in this case was a paper-based questionnaire and a national evaluation of the attitudes and beliefs of Bolivian teachers towards the use of ICTs in private life and at work place was made.

An empirical study was then carried out to answer the second question related to the teacher training courses. These courses are generally online due to the lack of personnel to train teachers, for this reason the effectiveness of the training software system, the contents and the quality of the courses were also evaluated. At this point, the perceived transfer was worse than expected.

To explain this phenomenon, interviews were conducted with teachers and principals of representative schools of the second empirical study.

Finally, to answer the third question and propose opportunities for improvement, she conducted a qualitative study based on interviews with Best Practices, which in this case are winning professors at the Educa Inova technology fair in Bolivia.

First results

- Bolivian teachers generally have positive personal attitudes towards the use of ICTs as a working and learning tools, and as media for communication and entertainment. These attitudes are more positive in urban areas. However, the attitudes towards the use of ICTs from social perspectives were more negative.
  More specifically, teachers considered their personal use as positive, though they were skeptical about the social use of ICTs, especially as a mean of entertainment and communication. Seven years after the introduction of the OLPT initiative, several teachers still consider ICTs, especially the internet, as a suppressor of creativity and interpersonal communication when used in learning.
- Teachers with more experience of ICT in their personal lives who have participated in virtual classes or who are engaged with social media presented more positive attitudes than others. Interestingly, in this group, the age ranges are varied and the dates on which they were provided with a laptop. The provision of the technology seems to influence the use of it at workplace.
- Attitudes towards the use of ICTs in urban and rural areas varied significantly. That may be due to the fact that internet access in the countryside is still very limited in Bolivia. Specifically, in some cases, the bandwidth would not be enough to watch a high-quality video or for playing an online game. This was the reason most frequently named by school principals during the pre-study.
- The vast majority of the teachers in the sample acknowledge the radical changes in society brought about by ICTs, though many of them are still afraid of the negative consequences with respect to their use for children and young people.
- Despite the teachers presented a usefulness of the training courses the teachers do not believe that they can apply what they learned in their actual teaching practice.
- More than half of teachers think that the content learned in training courses is not transferable in their actual teaching practice.

- This impossibility of transfer was justified by principals and teachers with the following obstacles:
  - Lack of cooperation for the maintenance of shared ICT spaces.
  - Lack of Technical and Pedagogical Support.
  - The limited access to internet in the rural areas in Bolivia.
  - Educational and interscholastic regulations need to be updated. (e. g. the use of smartphones within the school).
  - The negative effect of the obligation of use of ICTs -> Personal Attitude of teachers.
  - The Cost / Benefit of use of ICTs among others. Most teachers have their class structured without media, since the use of media is uncertain and many of them would not be willing to digitize their materials.

References

Altmann, T. K. (2008). Attitude : A Concept Analysis. *Nursing Forum, 43*(3), 144 150. https://doi.org/10.1111/j.1744-6198.2008.00106.x

Betemi Rawlins, V. M. (2019). La deformación de la reforma educativa en Latinoamerica [Blog]. *Politica y Educación.* https://politicayeducacion.com/la-deformacion-de-la-reforma-educativa-en-latinoamerica/

Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success : A ten-year update. *Journal of management information systems, 19*(4), 9–30, DOI: 10.1080/07421222.2003.11045748

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices : A critical relationship. *Computers & education, 59*(2), 423–435. https://doi.org/10.1016/j.compedu.2012.02.001

Njiku, J., Maniraho, J. F., & Mutarutinya, V. (2019). Understanding teachers' attitude towards computer technology integration in education : A review of literature. *Education and Information Technologies, 24*(5), 3041–3052. https://doi.org/10.1007/s10639-019-09917-z

Richter, T., Naumann, J., & Groeben, N. (2000). Attitudes toward the computer : Construct validation of an instrument with scales differentiated by content. *Computers in Human Behavior, 16*(5), 473–491.

Wood, W. (2000). Attitude Change : Persuasion and Social Influence. *Annual Review of Psychology, 51*(1), 539 570. https://doi.org/10.1146/annurev.psych.51.1.539

An Innovative Platform to Qualify Corporate Community Managers

Alexander Clauss, Dresden University of Technology

Within knowledge-based companies, online knowledge collaboration is enabled through internal networking of geographically dispersed employees who actively communicate with each other in online communities (OCs) (Faraj, Jarvenpaa, & Majchrzak, 2011). The defining characteristic of such OCs is their fluidity (Faraj et al., 2011), which includes the ability of organizational learning and to react flexibly and promptly to technological and market changes through innovation processes (Levinthal & March, 1993). Corporate Community Managers can provide a significant contribution to this fluidity of corporate online communities by channelling and leading online participation like a riverbed. Their range of tasks include planning, formation, operation, growth, and success of corporate OCs. Their primary objective is to gain sustainable added corporate values in these OCs through co-creation and collaboration. Their support is focused on encouraging proactive participation and fostering communication (Geißler, 2014).

The job profiles of CCMs can be characterized two-fold. On the one hand it combines a broad spectrum of requirements of social, technical, and organizational support, which has not been supported by vocational training and study courses so far and thus favors lateral entrants. On the other hand the CCMs should facilitate the organic growth of OCs in companies, which calls for a complementary qualification of the employees who manage them (Clauss et al., 2019). A solution to address this deficiency are qualification offers in the form of specific micro qualification modules instead of large classical trainings or rigid study modules. They allow the design of individualized, flexible further training measures with consideration of the respective personal and organizational framework conditions. However, it is exceedingly difficult for potential CCMs to find guidance for the development of necessary competences because of the lack of standardized and scientifically based qualification frameworks and competence profiles. Large companies already offer defined job descriptions and task profiles for CCMs, however these are designed to address specific company requirements and are therefore difficult to generalize from a scientific perspective.

This cumulative thesis is a design based research project (Hevner, 2007). It would not be useful to specify all research questions within the project at this point; instead, the research design is presented in the following. The overall research and design objective is to create an innovative platform (see figure 1) as an artefact for a guided competence development to qualify CCMs (A).

In a first paper an essential basis for the design of this platform, a self-evaluation tool was created, which allows a matching between personal and ideal competences of CCMs based on anchor examples. To identify and systematize these competences and examples, three in-depth interviews with experts were conducted. The resulting systematization of the professional competences of a CCM follows a strict scientifically grounded competence terminology. The identified competences show that CCMs are responsible for a wide range of strategic, conceptual and operational tasks. Corresponding competences range from domain-specific to social and personal skills.

Subsequently, the developed competences and anchor examples were confirmed, reformulated, and extended using a Delphi method with four corporate community management experts and five pedagogic experts. Based on these results a prototype for the self-evaluation tool was developed. By using this prototype existing qualification gaps can be identified (B).

In a next step, concrete, scientifically profound recommendations for the development of these competences are given to create a competence development guide. Therefore, it was necessary to model a framework for the competence-oriented qualification and professionalization in the field of digital community management. For this purpose, existing concepts for the development of digital competencies were reviewed in a systematic literature review. Their applicability for the creation of competence-oriented qualification modules was subsequently critically evaluated in five focus interviews with designers of qualification programs in the higher education context. Based on the results, design recommendations for the didactical development of specific micro-qualification modules were derived. These allow to describe scientifically grounded how previously missing competences on the required level can be gained (C).

It is planned to extend the platform to a competence shop and make it accessible for commercial providers of qualification measures who can classify their qualification offers based on the same anchor examples. The platform also gives them the opportunity to develop innovative programs for the identified competence levels as micro modules. It is in preparation to evaluate the applicability of this concept critically in a concluding focus group interview with providers of qualifications. Finally, when a shop solution will be implemented, then similar to customer reviews, participants will be able to evaluate the extent to which the qualification measure has contributed to their development of competences (D).

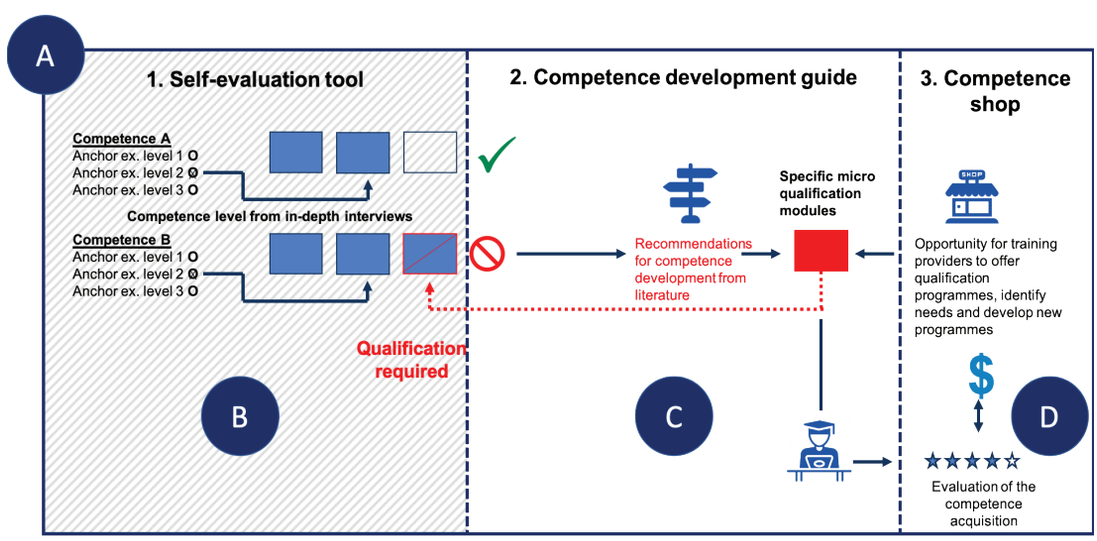

Figure 1. Overall design objective of the entire research project

References

Clauss, A., Collet, S., Laub, T., Lämmer, S., Schnurr, J.-M., & Wagner, D. (2019). S*ocial-Media- und Community-Management 2018.* Nordkirchen.

Faraj, S., Jarvenpaa, S. L., & Majchrzak, A. (2011). Knowledge Collaboration in Online Communities. *Organization Science*, *22*(5), 1224–1239. https://doi.org/10.1287/orsc.1100.0614

Geißler, J. (2014). Mythos Community Manager: Aufgaben, Rollen und Verantwortlichkeiten. In A. Richter (Ed.), *Vernetzte Organisationen* (pp. 252–260). München: De Gruyter Oldbourg.

Hevner, A. R. (2007). A three cycle view of design science research. *Scandinavian Journal of Information Systems, 19*(2), 4.

Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic Management Journal, 14*(S2), 95–112.

Characterising pervasive games as experiences: towards a design framework

Diane Dufort, University of Strasbourg

Games, especially digital games, are increasingly spreading in domains they used to be considered incompatible with. Indeed, they are nowadays used to provide innovative ways to visit museums, to support processes of innovation, for corporate training or to guide professional practices (etc.).

Among digital games, pervasive games have the particularity to create, in their gameplay, porous boundaries between reality and the game world, thus blending the game world in the player's ordinary life. These porous boundaries can concern the social, temporal or spatial boundaries of the game (Montola 2005; Montola 2007). In fact, a pervasive game has porous spatial boundaries if it is not played in a dedicated space virtual and/or physical; porous temporal boundaries if its game sessions are blended in ordinary life; and porous social boundaries if there is ambiguity about participants and non-participants.

Our contribution addresses a specific genre of pervasive games: serious pervasive games (SPG) which are pervasive games with a "serious" purpose (educational, informational, persuasive, advertisement, etc.) (Alvarez & Djaouti, 2010). Due to the porosity of their boundaries, SPG are complex objects to study and to produce. The latter, especially, requires the work of an interdisciplinary team (e.g. game designers, developers, artists, instructional designers, experts) composed of specialists and non-specialists of games.

To help them reach mutual understanding, the team members need methodological tools (Elverdam & Aarseth, 2007; Zagal, Mateas, Fernández-vara, Hochhalter, & Lichti, 2005) that enable them a) to describe and analyse pervasive games while taking into account: the wide variety and heterogeneity of media productions used in that particular type of games; and b) to explore the specificities of pervasive games in terms of narration, structure and usage of ICT to blur the boundaries between reality and the game world. The lack of tools generates significant obstacles during the first phases of a SPG design process, especially during the ideation phase, when the game concept is defined. To overcome these obstacles, one solution would be to develop tools such as typologies and design frameworks (Zagal & Bruckman, 2008; Zagal et al., 2005).

However, we observed that existing methodological tools, though they contribute to describe various dimensions of pervasive games and to establish a common vocabulary between the production team members, are not adapted to the production of SPG. Indeed, most of these tools provide a partial description of SPG (i.e. only one dimension such as time or space) or are made for specific subgenres (e.g. urban games, ARG).

Tools providing a complete description of pervasive games were designed to be used in a scientific context with a focus put on precision and objectivity. Therefore, they describe pervasive games as systems and not as experiences, meaning that they tend to discard most of the dimensions linked to the player and her individuality (e.g. moves, sensations, emotions)

In our contribution, we will introduce a collaborative SPG design framework that aims to describe SPG as experiences instead of only systems. In the first part, we will define essential notions around pervasive games such as ludicisation, pervasive computing and

media convergence. Then, we will provide a comparative analysis of existing solutions. Finally, we will describe the first level of our design framework and how this framework can be used in the design process of a serious pervasive game.

References

Alvarez, J., & Djaouti, D. (2010). *Introduction au Serious Game* (Questions Theoriques). Questions Théoriques. http://www.questions-theoriques.com/produit/2/9782917131084/Introduction%20au%20Serious%20game

Elverdam, C., & Aarseth, E. (2007). Game Classification and Game Design : Construction Through Critical Analysis. *Games and Culture, 2*(1), 3 22. https://doi.org/10.1177/1555412006286892

Montola, M. (2005). Exploring the edge of the magic circle : Defining pervasive games. *Proceedings of DAC*, 1966, 103.

Montola, M. (2007). Tangible Pleasures of Pervasive Role-Playing. In B. Akira (Éd.), *Situated Play : Proceedings of the 2007 Digital Games Research Association Conference* (p. 178–185). The University of Tokyo. http://www.digra.org/dl/display_html?chid=07312.38125.pdf

Zagal, J. P., & Bruckman, A. (2008). The Game Ontology Project : Supporting Learning While Contributing Authentically to Game Studies. *Proceedings of the 8th International Conference on International Conference for the Learning Sciences - Volume 2*, 499–506. http://dl.acm.org/citation.cfm?id=1599871.1599933

Zagal, J. P., Mateas, M., Fernández-Vara, C., Hochhalter, B., & Lichti, N. (2005). Towards an Ontological Language for Game Analysis. *in Proceedings of International DiGRA Conference,* 3–14.

Online learning in Covid-19: case of Cameroon

Steve Edgar Feze Feugang, University of Yaoundé 1

The advent of the corona virus pandemic has brought back the issue of distance or online learning in Cameroon. This research project focusing on this issue aims to draw the attention of education professionals in Cameroon to this learning mode by demonstrating its added value. Our work is guided by two pedagogical approaches, namely cognitivism and socio-cognitivism, and based on two main questions:

- Which features should be found in a TEL so that they meet the constructivist and socio-constructivist requirements?
- What are the requirements for e-learning?

Our hypothesis to the first question is that a TEL must provide features allowing students to interact with each other and control their learning processes and knowledge-building. For the second question, we hypothesise that e-learning requires training teachers to TEL development and to the use of LMS or LCMS, and acquainting learners with ICT.

During our research, we investigated the practice of distance learning in Cameroon throughout the period when schools were closed, with the interruption of face-to-face classes. Through a quantitative search, we used a questionnaire for a sample of less than 1000 subjects, i.e. 800 learners and 93 teachers. Literature search on both general and technical documents allowed us to specify the TEL features. The data from the questionnaires was subject to quantitative analysis using a spreadsheet program and the data from the literature search was assessed from a qualitative point of view.

Our research led us to look at the infrastructural parameters, namely internet coverage in the country. We found that 74.15% of the learners surveyed reported a poor internet connection. 51.02% of teachers surveyed rated it low, and 42.85% of teachers very low. Actually, e-learning, as Benraoune (2011) points out, requires a fast and stable connection to the internet. However, a poor connection quality can make e-learning unpleasant and maybe demotivate the learner and even the teacher. We have therefore taken an interest in the quality of online learning. We found that 86.51% of the learners surveyed reported a poor understanding of courses delivered through distance learning. This result allows us to question the training of teachers in conducting this mode of learning. For example, we found that 97.95% of the teachers surveyed never received training in e-learning. These results highlight the fact that the development of TEL and distance learning is not yet effective in Cameroon. Therefore, our work will focus on describing, on the one hand, the pedagogical engineering behind the development of TEL and LMSs or LCMSs, and on the other hand, on presenting the good practice and the added value of distance learning.

References

Allen, E. & Seaman, E. (2008). *Staying the Course: Online Education in the United States,* The Sloan Consortium.

Bangert, A. (2004). *The seven principles of good practice: A framework for evaluating en ligne teaching,* The internet and higher education.

Benraouane, S.A. (2011). *Guide pratique du E-learninq, stratégie, pédagogie et conception avec le logiciel Moodle,* Dunod.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). *Evaluation of evidence based practices in online learning : A meta-analysis and review of online learning studies,* Office of Planning, Evaluation and Policy Development.

Trump Card Played? Risks and Side Effects of Gamification

Matthias Heinz, Dresden University of Technology

Studies on gamification often refer to the evaluation of individual projects and usually show only positive results (Koivisto & Hamari, 2019; Majuri, Koivisto & Hamari, 2018). However, when a trend is established, it is important to critically examine the possible risks and negative side effects. This seems more necessary than ever, especially in the context of gamification of the masses, as can be seen in the example of the plan to introduce a nationwide social credit system in the world's second largest economy.

Answering the question of what risks and side effects can be associated with the use of gamification is crucial to the decision whether and how gamification is used. Thus, the presentation follows the research desideratum of Koivisto and Hamari (2019), who concluded in their recent and comprehensive gamification literature review that the potential negative, adverse or non-preferred effects of gamification, and how these can be mitigated, should be explored.

To this end, it is imperative to look at the so-called Dark Side of Gamification (DSoG), and to address the literature on the term DSoG. Therefore, the following questions will be pursued:

1) What risks and side effects are mentioned in the context of DSoG?

2) What alternative terms are there for DSoG?

The DSoG will be made accessible via a literature review with the aim of identifying the horizon of possible risks and side effects of gamification. The second question, on the other hand, aims to identify necessary keywords on the research gap for further analysis. 17 relevant publications were identified in 3 steps, which deal with the term DSoG or dark side in the context of gamification. These were published in the years 2015 to 2020.

Within these publications many risks and negative side effects are declared, which could be caused by gamification. In a group discussion among employees with expertise in the field of Game Based Learning, those were assigned to jointly formed categories. The broad categories are behaviour, motivation, intention, performance, data and emotion.

To answer the second question, the alternative terms were clustered. These range from negative effects, consequences, outcomes and impacts to implications and issues as well as other DSoG alternative terms that cannot be further clustered. These potential keywords will be used in a future comprehensive search for risks and negative side effects outside of the DSoG.

All potential risks and side effects presented were identified separately from their context. This does not detract the goal of uncovering the horizon of risks and side effects. The identified potential risks weigh differently in terms of their negative effects. The article cannot claim to be a complete list of risks and side effects. First of all, it need to collect the variety of terms that take up negative effects with synonyms. A first step was taken with the use of synonyms for the DSoG.

Despite these limitations, this presentation sensitizes the reader to the risks and

negative side effects of gamification and can thus anticipate possible negative effects. Knowledge about the possible negative effects of gamification is important in the teaching and learning context. Teachers who use gamification mechanisms to make their scenarios motivational and interesting must know that positive aspects do not necessarily arise and can even be reversed. For example, a gamified teaching scenario can lead to excessive demands or distraction of learners if the game and learning context are not sufficiently coordinated. Learners must also be sensitized to the negative consequences of gamification to prevent them from entering into a flow that diverts them from the actual (learning) goal or even causes effects (e.g. envy, fears) that can hinder the learning process.

References

Hyrynsalmi, S., Smed, J., Kimppa, K.K. (2017). The Dark Side of Gamification: How We Should Stop Worrying and Study also the Negative Impacts of Bringing Game Design Elements to Everywhere. In P. Tuomi & A. Perttula (Eds.), *Proceedings of the 1st International GamiFIN Conference, Pori, Finland, May 9-10 2017*, pp. 105-110.

Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification literature. *International Journal of Information Management*, 45, 191-210.

Majuri, J., Koivisto, J., & Hamari, J., (2018). Gamification of Education and Learning: A Review of Empirical Literature. In *Proceedings of the 2nd International Gami-FIN conference. CEUR Workshop Proceedings,* 2186, pp. 11-19.

Toda, A., Valle, P. H. & Isotani, S., (2018). The Dark Side of Gamification: An Overview of Negative Effects of Gamification in Education. In A. Cristea, I. Bittencourt & F. Lima (Eds.), *Higher Education for All. From Challenges to Novel Technology-Enhanced Solutions. Proceedings of the First International Workshop on Social, Semantic, Adaptive and Gamification Techniques and Technologies for Distance Learning, HEFA 2017,* Maceió, Brazil, March 20-24 2017, Revised Selected Papers. Communications in Computer and Information Science, 832. Cham: Springer, pp. 143-156.

Immersive Technology for More Personalized, Dynamic and Effective Approach in Learning

Yuliana Irma, Universitas Negeri Yogyakarta

In recent years, a major revolution occurred in immersive mobile computing. Then a new trend emerged for devices using virtual reality (VR) which defines the main spectrum of immersive technology that has the potential to replace cellular computing.

Virtual Reality technology is able to provide new experiences for users and when combined with learning, the delivery of material will be more enjoyable. So far, Virtual Reality technology has been used in various fields, such as military war simulations, crime scene investigative training(Liu et al., 2018), therapeutic solution for different phobias (De Oliveira & De Oliveira, 2017), airplane flight simulations, medicine for surgical simulations, and education used as learning media (Liou & Chang, 2018).

Basic computer assembly is a subject in Vocational School especially for students majoring in Computer and Network Engineering. This subject discusses the introduction of computer components, an explanation of the functions and uses of each computer component, how to assemble desktop computer.

Computer assembly material discusses various kinds of computer assembly equipment such as CPU casings, hard drives, motherboards, CD-ROMs, processors, fans/heatsinks, RAM (Random Access Memory), LAN cards, VGA cards, and power supplies. Assembly practice is carried out in a room that meets standards including safety and security. So it is very important to build an atmosphere that can build user motivation for task responsibilities in assembly (Callaghan et al., 2015).

Based on the results of observations at the vocational school, in carrying out learning activities there are problems including the material presented to students still using conventional methods, namely teacher-centered learning, lack of use of instructional media, and recognition support devices. Computer equipment is classified as small so that practicum activities are not optimal, and students' interest in participating in learning is still low. The research was conducted by developing a new environment in learning through VR, whether it is able to provide learning motivation so that it can increase understanding of the learning subject.

The development stage begins by determining the type of application, target users, and the purpose of creating media. Virtual reality-based learning media on computer assembly material, supports learning through simulation of computer component assembly. Design stage contains specifications regarding the material, use case diagrams, activity diagrams, and User Interface (UI) display designs. The material used is about computer assembly which refers to the syllabus and the content required for media production includes 3D components, images, sound and video. Meanwhile, media development uses several software including Unity 3, Blender, CorelDraw X7. Assembly is carried out after all multimedia material is collected. The design of learning media based on Virtual Reality is based on the syllabus, use case diagrams, activity diagrams and user interface (UI) display designs.

This media displays a learning simulation on computer assembly material that is made like its original form. So that users can assemble a CPU with the components that have been provided. Implementation in VR is done using a Smartphone for installation in .apk format, equipped with VR Box, and Controller.

The testing phase is carried out through alpha testing and beta testing. Alpha testing is carried out by media experts and material experts to determine the feasibility of the media and material used. While beta testing is carried out by vocational students based on System Usability Scale (SUS) method after practicing.

The distribution stage is the stage where the application is saved into an .apk that can be used on a smartphone and in a storage medium. Like a hard disk or memory that has previously been made into an .apk file so that it can be used by the user.

Some of the technical issues related to virtual reality are optimization and rendering. Previously, this technique has been widely applied to games with the best resolution by displaying characters and images that are clear and almost real (Borba et al., 2017).

Recently an idea of using AI (Artificial Intelligence) for virtual reality has emerged, which will bring a multitude of benefit.AI combined with virtual reality is very powerful to use as a learning tool close to the real world that is difficult to make beforehand or quite expensive to realize. Thus, this research still needs to be developed not only on content but also on delivery

References

Borba, E. Z., Montes, A., De Deus Lopes, R., Zuffo, M. K., & Kopper, R. (2017). Itapeva 3D: Being Indiana Jones in virtual reality. *Proceedings - IEEE Virtual Reality*, 361–362. https://doi.org/10.1109/VR.2017.7892326

Callaghan, M., Gomez Eguiluz, A., McLaughlin, G., & McShane, N. (2015). Opportunities and challenges in virtual reality for remote and virtual laboratories. *Proceedings of 2015 12th International Conference on Remote Engineering and Virtual Instrumentation, REV 2015, February,* 235–237. https://doi.org/10.1109/REV.2015.7087298

De Oliveira, R. E. M., & De Oliveira, J. C. (2017). Virtual reality system for the treatment of acrophobia. *Proceedings - 19th Symposium on Virtual and Augmented Reality, SVR 2017,* 74–77. https://doi.org/10.1109/SVR.2017.18

Liou, W. K., & Chang, C. Y. (2018). Virtual reality classroom applied to science education. *23rd International Scientific-Professional Conference on Information Technology, IT 2018, 2018-January,* 1–4. https://doi.org/10.1109/SPIT.2018.8350861

Liu, B., Campbell, A. G., & Gladyshev, P. (2018). Development of a cybercrime investigation simulator for immersive virtual reality. *Proceedings of the 2017 23rd International Conference on Virtual Systems and Multimedia, VSMM 2017, 2018-January,* 21–4. https://doi.org/10.1109/VSMM.2017.8346258

The learning experience assessment of Serious Games

Ying-Dong Liu, University of Strasbourg

The American researcher Clark C. Abt proposed Serious Game (SG), who asserted that games could educate and provide enjoyment (Abt, 1970). According to Peery and Pasalar (2018), the success of SG has two important aspects: teachers need to be comfortable using SG as an educational method, and learners could have an enjoyable learning experience using SG. From this perspective, design an SG that allows learners to have an enjoyable learning experience is a priority. The learning experience is the perception of how learners feel during the learning process, encompassing interaction with resources, and the learner's environment. A better user experience contributes to a better learning experience (Cano et al., 2017). User Experience (UX) "encompasses all aspects of the end-users interaction with the company, its services, and its products" (Nielsen Norman Group, 2016). It is integral to any product's design and important to consider when evaluating the learning experience.

Although some researches have been conducted on UX of SG, few studies have focused on SG's learning experience. Our work intends to create a model for learning experience satisfaction assessment of SG. Based on contemporary learning theories, the learning process, and the experiential learning theory (Kolb, 1984), we try to define the learning experience and the characteristics that may optimize the learning experience. We question whether the characteristics of the learning experience listed in our research are important in the evaluation of Serious Games according to game designers and gamers?

We use the exploratory methodology to answer this research question. We will interview 15 experts (teachers, game designers, user experience designers, and gamer experts) who work in SG and play SG. Then, we survey end-users (students) to identify the key elements to assess the learning experience satisfaction with SG. We assume that the game designers and gamers interviewed do not consider the characteristics of the learning experience listed in our research during the SG evaluation phase. After interviewing 4 experts, the preliminary result shows that most of the learning experience characteristics were chosen for the SG evaluation, such as clarity of learning objective, compatibility, emotional, feedback. The characteristics identified in this theoretical framework and the qualitative study contribute to the following quantitative study and would make it possible to build a Serious Game learning experience satisfaction assessment model.

References

Abt, C. C. (1970). *Serious Game*. New York: Viking Press.

Preece, J. Rogers, Y. et Sharp, H. (2002). *Interaction design: beyond human-computer interaction.* Chichester: John Wiley & Sons.

Canoa, S., Collazosb, C. A., Aristizábalb, L.F., Gonzalezd, C.S., Moreirae, F. (2018). Towards a methodology for user experience assessment of serious games with children with cochlear implants. *Telematics and Informatics,35* (2018), 993–1004.

Nielsen Norman Group. (2016, 2 July). *Don Norman: The term "UX".* [vidéo]. YouTube. https://www.youtube.com/watch?v=9BdtGjoIN4E&feature=emb_logo

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development.* New Jersey: Prentice Hall.

Cooperation in the field of vocational education and training: research on cooperation between learning places in the area of hotel management in Indonesia

Rita Fransina Maruanaya, Dresden University of Technology

In Indonesia, Vocational High School (VHS), or generally known as Sekolah Menengah Kejuruan (SMK), is a formal vocational education program which aims to educate and to prepare well-qualified graduates who are capable of attending to all aspects of workspace in accordance with their competences. Furthermore, they are expected to serve as a competent person in business and industry for facing global competition (Decree of Ministry of Education and Culture No. 080/U/1993). In order to achieve these objectives, the government had tried several times to restructure the education system. However, there are constant problems emerged. First, at macro-level; changes in qualification requirements of business and industry bring out a not demand-oriented of the existing vocational education system. Requirements for the qualifications and skills of employees will be higher than at present because the companies will use new technologies and smart media. For this reason, the education system must be changed continuously. Too often changes in education policy, regulations, and curriculum also cause the low quality of vocational education and training because the vocational schools are not ready with the new curriculum. Second, at meso-level; lack of quality of "in-school training" as well as "in-company training", the inadequacy of teacher training, the curriculum includes more general subjects which allow for more theories than practice, and insufficient cooperation between school and company. Third, at micro-level; lack of qualified teachers and trainers cause the rise of low qualified graduation (Euler, 1999). Concerning vocational training, "in-company training" also plays a very important role. Learning in the workplace is always in the foreground of vocational training. Changes in technology and changing work concepts in companies call for cooperation between vocational schools and companies. Vocational schools aim to train vocational students so that they will be able to empower and be competitive in the job market in the future. For this reason, the vocational schools must have strong cooperation with the companies so that the students can also learn or practice at the workplace (Yusmina et al., 2014).

This research focuses on the cooperation between learning places (Vocational High School and Company) in the area of Hotel Management in Indonesia. The main aim of this research is to examine the cooperation activities of selection schools and hotels in four Provinces namely Maluku, Papua, Yogyakarta, Ost Java. To be closely examined and analysed are design of vocational training and education, implementation, financing, organizational structures and personnel development. The research question also considers the factors that influence the development and implementation of the cooperation between learning places, the strengths and weaknesses of the cooperation, as well as similarities and differences which can be found in the implementation of cooperation between the learning places in vocational training and education in those provinces. Another major focus of the research is analysing of national regulations related to cooperation between the learning places.

The project carries out an extensive of literature on cooperation in vocational training and education such as definition, objective, intensity, main and relevant components, factors

influencing the realization of cooperation of learning places, and international perspective on cooperation between learning places.

Hypothesis of this study are 1). The national educational regulation promotes the implementation of the cooperation between the learning places in vocational training and education heavily. 2). The Industry is involved in designing, implementation and financing within the scope of cooperation between learning places in Maluku, Papua, Yogyakarta and Ost Java. 3) The efficient organizational structures and personnel development are required in the Implementation of the cooperation between learning places in the area of Hotel management in Maluku, Papua, Yogyakarta and Ost Java. 4) Similarities and differences are found in the Implementation of the cooperation between learning places in the area of Hotel management in Maluku, Papua, Yogyakarta and Ost Java.

Both qualitative and quantitative research methodology was employed in this study. The qualitative research data consisted of National Educational Regulations of Republic of Indonesia and 5 in-depth interviews : three of them with experts in the field of vocational training and education of ministry of education in Jakarta, Indonesia and two others with experts in the field of vocational training and education of educational attache of Indonesian Embassy in Berlin, Germany. The quantitative research data was gathered using questionnaire for Teachers of Vocational High schools and Trainers of selected hotels.

In terms of finding, it has been revealed that 1) the support of National Educational Regulations of Republic of Indonesia on the implementation of the cooperation between learning places in vocational training and education is very low. 2) The participations of the industry in designing, implementation and financing within the scope of cooperation between learning places in Maluku and Papua are very less, while in Yogyakarta and East Java are very high. 3)The requiring of The efficient organizational structures and personnel development in the Implementation of the cooperation between learning places in the area of Hotel management in Maluku and Papua are very less than in Yogyakarta and Ost Java. 4) There are several Similarities and differences are found in the Implementation of the cooperation between learning places in the area of Hotel management in Maluku, Papua, Yogyakarta and Ost Java.

References

D. P. R. Indonesia, “Keputusan Mendikbud Nomor 080/U/1993 tentang Kurikulum Sekolah Menengah Kejuruan.” Jakarta, 1993.

Euler, D. (1999). Kooperation der Lernorte in der Berufsbildung. Gutachten zum Programm. *Bonn : BLK 1999, 51 S. - (Materialien zur Bildungsplanung und zur Forschungsförderung.*

Yusmina, E., Murniati, A., & Niswanto. (2014). Implementasi Manajemen Mutu Terpadu dalam Peningkatan Kinerja Sekolah Pada SMK Negeri 1 Banda Aceh. *Jurnal Administrasi Pendidikan - Pascasarjana Universitas Syiah Kuala, 2*(2), 168-178.

The contribution of vocational skill development toward inclusive industrial dynamics and transformation.

Development of a training concept for enhancing TVET teachers' professional competences in the garment industry of Lao PDR

Santiphap Meunmany, Dresden University of Technology

The main purpose of this research is to do applied study to is to find out which vocational skills initiative need to develop a training concept in the fields of garment industry, particularly necessary for labours in their professional practice such as to find out critical factors that contribute to inclusive industrial dynamics and transformation in the fields of garment industry, to find out the vocational skills in demand in terms of garment industry for labour that lead to industrial development in Lao PDR and develop training concept for garment industry which focus on enhancing TVET teachers' professional competences in the garment industry of Lao PDR.

Research question

- What are the critical factors that help or hinder vocational skill development in Lao PDR that contribute to inclusive industrial development and transformation?
- What are the vocational skills in demand for labour that meet dynamic needs of industry in Lao PDR?
- What are the components, processes, and procedures of training concepts to enhance professional competences in the light of the 'Vocational skill development Initiative' in the Lao PDR?
- How does the training concept enhance professional competences in the light of the 'Vocational skill development Initiative' in the Lao PDR?

Hypothesis

The research will test the following three hypotheses:

- Vocational skills development initiatives that focus on higher skill levels are likely to contribute to inclusive industrial growth and transformation.
- Vocational skills development initiatives that aim to help companies to access low qualified labour are less likely to trigger inclusive industrial dynamics and transformation.
- Teacher Trainees who participated in the teacher training as developed by the thesis are equipped with better professional (pedagogical / technical / technological) competences.

Research methodology and design

The research is followed by the research and development methodology, which comprises both qualitative and quantitative methods. The process of the analysis of critical factors on the contribution of VSD to industrial dynamics and transformation is divided into three research phases namely: (1) Phase I: to find out essential factors that contribute to inclusive industrial dynamics and transformation, (2) Phases II: to find out the vocational skills in demand for labours that lead to industrial development in Lao PDR and to develop training concept for garment industry on operational level

To collect available information, the study will use questionnaires and interviews as instruments to achieve the objectives of the research. The main population of this study

is managers, technicians, administrators, line supervisors, and employers in the garment industry and TVET teachers. Concerning data analysis, the study will use the Nvivo program.

Expect research results

- Finding of critical factors that contribute to inclusive industrial dynamics and transformation in Lao garment industry.
- Finding of the vocational skills in demand for labours that lead to industrial development in Lao PDR.
- Develop the "Training Concept" in cooperation with Vocational Schools/colleges and Industries base on competency-based standard (CBS) of National and Regional TVET.

References

Clarke, G. R., Nghardsaysone, K., Record, R. J. L., & Seror, M. A. R. (2014). *Main report (No. 90960; pp. 1–0)*. The World Bank. http://documents.worldbank.org/curated/en/657941468047058362/main-report

Ministry of Education and Sports of Lao PDR. (n.d.). Education Sector Plan 2016-2020. Lao PDR. Retrieved April 5, 2019, from https://www.globalpartnership.org/content/education-sector-plan-2016-2020-lao-pdr

Ministry of Planning and Investment of Lao PDR. (n.d.). *8th FIVE-YEAR NATIONAL SOCIO-ECONOMIC DEVELOPMENT PLAN (2016–2020)*. United Nations Lao PDR. Retrieved April 5, 2019, from http://www.la.one.un.org/media-center/publications/258-8th-five-year-national-socio-economic-development-plan-2016-2020

Najdov, E., & Phimmahasay, K. (2016). *Lao economic monitor - Challenges in promoting more inclusive growth and shared prosperity: Thematic section - drivers of poverty reduction in Lao PDR (No. AUS17628; pp. 1–46)*. The World Bank. http://documents.worldbank.org/curated/en/515521468197368035/Lao-economic-monitor-Challenges-in-promoting-more-inclusive-growth-and-shared-prosperity-thematic-section-drivers-of-poverty-reduction-in-Lao-PDR

OECD. (2017). *OECD Investment Policy Reviews: Lao PDR*. OECD. https://doi.org/10.1787/9789264276055-en

Paryono. (2013). Mapping national and regional TVET initiatives in Southeast Asia and beyond in response to students and labour mobility. *TVET@ Asia, 1*, 1–8.

The integration of ICT in the teaching of mathematics in Gabon: test in a learning situation in a scientific second class

Georges Moellet Nzaou, University of Strasbourg

I would like to share with you the subject of my researches when I was a mathematics teacher in a high school during more than ten years in Gabon, Central Africa. I noticed the distress of some students who had great difficulties to understand some chapters of geometry. These difficulties were caused by the significant level of abstraction needed to understand this discipline. The aim of my thesis is to try to eradicate this phenomenon by using geometry softwares for the chapters known as too complex for learners. In order to do so, I think it woold be wise to test two groups of high school science students during their first year. One of these two groups would be a control group and the other would have the opportunity to try some geometry softwares. To sum up, the subject of my thesis will be: the integration of communication technologies (ICT) in the teaching of mathematics in Gabon: test in a learning situation in a scientific second class.

Methodological approach:
Our study will be organized in three phases: the first phase will include some exploratory interviews which will allow us to assess the real situation of the problematic of ICT in the teaching of mathematics in Gabon: the second phase will consist of a questionnaire intended for teachers.

For these two phases, the data processing will be carried out using a “statistics” tool using Excel as relay software. We will also use the Unified Theory of Acceptance and Use of Technology (TUAUT) which will allow us to estimate the specific educational use of ICT and the behavioral intention of teachers to accept ICT in their pedagogical practices in addition to the binomial model which will allow us to model our qualitative variable with two modalities (accept or not, the use of ICT) and the third phase, where we will choose as a methodological tool: the experimental method. Indeed, we are going to take two groups of students of scientific second, a second that we will call “A” (control class) and the other “B” as experimental class we are going to a chapter in geometry which causes more difficulties to the students. Then, we will use dynamic geometry software in a computer room (selected from the few establishments that have computer rooms). In addition, for more objectivity in our research, we entrust the two classrooms to the same teacher. At the end of this chapter, we will proceed to an evaluation, the presentation of the results will be done in Excel, followed by the analysis and interpretation of the results obtained. We will use the student (t) test on small independent samples (the numbers of students in the second science classes in Gabon are less than 60 students) to compare the results of the control class (A) and the experimental class. (B).

Measures for vocational education teachers to encourage cooperation between learning locations

Carmen Neuburg, Dresden University of Technology

Topic: cooperation between learning locations

First of all, it should be emphasized that the learning locations, company and school, differ significantly in terms of their target orientations, their legal status, the work situations of the teachers Euler, 1999, p.12). So, we have to deal with different needs. Nevertheless, there is increasing demand for the vocational school to be more closely involved in dual vocational training so that both training locations - school and company - work together and not side by side. The importance of this topic becomes clear with a look at the topic radar (Ebbinghaus, 2018) from the Federal Institute for Vocational Education and Training BBiB. The current, central topics for dual vocational training were identified by 383 vocational training experts. This includes - unsurprisingly - the digitization of the working world at first place. However, strengthening the vocational school as a partner in dual vocational training is named in fourth place. According to the study, digitization already has a high priority, which - which was also examined - should nevertheless be even higher. But the vocational school, on the other hand, is currently of little importance and should increase significantly in its relevance and consideration.

Theoretical approach

There are various models to systematize the cooperation between the learning locations in dual vocational education. Euler's (2004) three-stage model of cooperation between learning locations forms the basis for further analyzes in the literature. This model is based on the assumption that cooperation between learning locations can take place on three levels, which differ in terms of their intensity of cooperation. The first stage is the information, which includes the transfer and acquisition of information between the learning locations, for example on the basis of an exchange about everyday working life. The coordination forms the second level of the model and is therefore more cooperation-intensive than the information. At this level the learning locations are coordinated. These measures will be implemented independently then. The third and most cooperation-intensive level of the model is cooperation. At this level there is direct cooperation between the learning locations, whereby common goals are agreed and pursued.

The form of cooperation between learning locations depends not only on the intensity of the cooperation, but also on the attitude and acceptance of the cooperation partners towards the cooperation. Pätzold (2003) differentiates between four various understandings of cooperation that influence the cooperation between the learning locations. According to this model, the pragmatic-formal understanding of cooperation is based on external causes and thus the cooperation requirements from outside. The cooperation activities in the pragmatic-utilitarian understanding of cooperation, are based on a one-sidedly experienced need that can be met through cooperation between the learning locations. The didactically and methodically justified understanding of cooperation is based on methods of professional learning, according to which there mind be value from cooperative action for professional education. Finally, the concept of educational theory represents a form of cooperation that incorporates the didactically and methodically based understanding goes beyond it. Which enables target

perspectives to be derived for social action. While the first two understandings of cooperation predominate in the practical implementation, Pätzold emphasizes the other two understandings of cooperation as a goal for cooperation between learning venues in vocational training (Pätzold, 2003).

Research design

The research design consists of three independent studies. In the first part, prospective teachers are asked qualitatively about their current level of knowledge about cooperation between learning locations (this part has already been completed). First of all, it is examined if they know the term "learning place cooperation" and what misconceptions prevail. The answers were evaluated with the qualitative content analysis according to Mayring (2015) and divided into categories.

Likewise, potential measures that strengthen the connection between companies and vocational schools as well as possibilities for the profitable use of digital media for this process were surveyed. It is particularly noteworthy that multiple-way communication was mapped more frequently in the targeted question about digital media than in the basic measures. Digital media seem to be particularly suitable for increasing the degree of interaction within the cooperation between learning locations.

In the second part, three trainers and tree teachers will be asked in qualitative and partially standardized interviews what contribution they would like teachers to make to the cooperation between learning locations. In the last part, all analyzed measures are then divided into the areas 1: teachers and teaching, teachers and trainees, 3: teachers and trainers and 4: teachers for themselves. The five most frequently and most intensively discussed measures are reflected back in a quantitative questionnaire to teachers, trainees and trainers and the results are superimposed. In this way, it is possible to compare which measures are of central importance for everyone and which can be used to target special other groups

Research question(s), the hypothesis(es)

- Hypothesis 1: Prospective teachers have insufficient knowledge of what cooperation between learning location is.
- Hypothesis 2: Teachers can actively support cooperation between learning locations on their own initiative
- Hypothesis 3: Apprentices, trainers and teachers value different measures for cooperation between learning locations.
- Hypothesis 4: Media can be used specifically for communication, documentation and organization of the cooperation between learning locations.

References

Ebbinghaus, M. (2018). *Themenradar - Duale Berufsausbildung – Frühjahr 2018*. Bonn: Barbara Budrich

Euler, D. (2004). *Handbuch der Lernortkooperation. Band 1: Theoretische Fundierungen.* Bielefeld: Bertelsmann.

Euler, D. et al. (1999). Kooperation der Lernorte im dualen System der Berufsbildung. Bericht über eine Auswertung von Modellversuchen. Bonn: BLK, (73) 2, 1-416 (Materialien zur Bildungsplanung und zur Forschungsförderung; 73)

Mayring, P. (2015). *Qualitative Inhaltsanalyse. grundlagen und Techniken.* Weinheim: Beltz.

Pätzold, G. (2003). *Lernfelder-Lernortkooperationen. Neugestaltung beruflicher Bildung.* Dortmunder Beiträge zur Pädagogik. 30, Bd. 30. Bochum: Projekt Verlag; Projekt-Verl.

Exploring Industrial Designer's Inspirational Sources and Design Methods

Ying Sun, Dresden University of Technology

Design idea generation is a significant part of the designer's work and most frequently associated with creative problem-solving. However, an outstanding challenge in design is translating empirical findings or other inspirational sources into ideas or knowledge that inform design, also known as generating implications for design (Sas et al., 2014; Meneweger et al., 2012). Though great efforts have been made to bridge this gap, there is still no overall consensus on how to appropriately incorporate research data and external sources into the design ideas generation process (Diggins & Tolmie, 2003). Besides, design ideas generation is a process that is rooted in personal knowledge. It is often considered a precedent-based type of reasoning where knowledge is continuously transformed to frame new insights and this creative leap across the divide is perceived to be difficult, especially for novice and student designers (Mougenot et al., 2008).

Based on the grounded theory, the author conducted open-ended, semi-structured qualitative interviews with eighteen designers, including design professors, practitioners and students to learn about the knowledge on how the contemporary designers select inspirational sources and transform them into ideas with appropriate methods in different contexts, the design mindset involved during the iterative and generative ideation process, and the criteria of evaluating design ideas. The results indicated seven commonly used categories of sources: 'personal,' 'daily stuff,' 'media,' 'technology,' 'knowledge of other disciplines,' 'fieldwork' and 'design practice.' The methods could be allocated to three stages: investigation, analysis and synthesis. In each specific phase, designers applied different methods to cope with various sources for various purposes, depending on different situations. A general framework was built for designers to conduct a proper selection of sources and methods to transform them into the knowledge that informs design. The study emphasized the flow of inspirational sources, the relationship between sources and methods, and the transformation procedures which tried to help the designer get more scientific structure and give design students more practical guidance in idea generation.

The comparison was continuously made within the matrix structure on the matter of sources and methods selection, the role of design research and ideation process among different groups of designers in academics and practice, which revealed the knowledge and skills missed or ignored in university education and challenges in the design project development. The implications for design education were discussed, such as the development of design students' competence, especially the skills that should be learned in a new digital society to help design education refine idea generation methods and improve corresponding techniques to discover a dynamic balance between theory and practice.

References

Diggins, T., & Tolmie, P. (2003). The « adequate » Design of Ethnographic Outputs for Practice : Some Explorations of the Characteristics of Design Resources. P*ersonal Ubiquitous Comput., 7*(3–4), 147–158. https://doi.org/10.1007/s00779-003-0226-y

Meneweger, T., Sundström, P., Obrist, M., & Tscheligi, M. (2012). How Designers Can Make Sense of Qualitative Research Findings : A Case Study. *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design,* 162–165. https://doi.org/10.1145/2399016.2399041

Mougenot, C., Bouchard, C., Aoussat, A., & Westerman, S. (2008). *Inspiration, images and design : An investigation of designers' information gathering strategies.*

Sas, C., Whittaker, S., Dow, S., Forlizzi, J., & Zimmerman, J. (2014). Generating Implications for Design through Design Research. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* 1971–1980. https://doi.org/10.1145/2556288.2557357

Learn a foreign language digitally when you are illiterate

Chayma Yagoubi, University of Strasbourg

The integration of TIC in French language training for illiterate migrants is likely to achieve the expected objectives in terms of knowledge and skills acquisition. Thanks to online videos and pictograms, migrants who are ignorant of the language of their host country can better learn the basics. Legros and Crinon promote the use of TIC in language teaching-learning in the following terms: "the computer can be a tool that supports language teaching and the vehicle, with didactic software that facilitates acquisition" (2002, p.18). TIC have a dual role: the first in the circulation of information and the dissemination of knowledge, and the second in the provision of digital tools at the service of all (Marquet, 2015).

Individualized exercises thus promote the cultural integration of migrants. In addition, carrying out computer tasks develops their computer skills. Consequently, by also mastering IT tools, they have a better chance of entering the labour market, especially since the qualifications of immigrants who do not master the language of a host country are underestimated. Therefore, in the framework of this research, I am focusing on teaching French to migrants who cannot read and write their mother tongue. In order to do this, I rely on computer tools to develop their autonomy in learning French and to develop their computer skills to facilitate their professional and cultural integration.

Illiteracy and illiteracy in developed societies are considered as social lesions because the lack of mastery or insufficient mastery of the written word represents a real social handicap in these hyper-scriptualised societies (Adami, 2008). "Today, less than one in two foreigners who have taken a 200-hour language training course under the Republican Integration Contract manage to reach a basic level of French (A1)" (Colloque CESE, 2017, p.1). Consequently, the question arises: "How can we improve the courses, in person, with digital tools, in terms of teaching French to migrants in order to promote their integration into society? ».

References

Adami, H. (2008). *Le rôle de la littératie dans le processus d'acculturation des migrants,* Strasbourg : Conseil de l'Europe. Division des Politiques linguistiques.

Colloque CESE. (2017). *Politique linguistique française : les enjeux d'aujourd'hui et de demain Travail, immigration et langue française.* https://www.gouvernement.fr/sites/default/files/contenu/piece jointe/2017/10/discours_aurelien_tache_181017.pdf

Legros, D., & Crinon, J. (2002). *Psychologie des apprentissages et multimédias,* Paris : Armand Colin.

Marquet, P. (2015). Enseigner avec les TIC : innover sans se tromper est-il possible. Université de Grenoble Alpes : Innovation ? une problématique pluridisciplinaire, https://innovatio.univ-grenoble-alpes.fr/index03db.html?id=237

GUI as generator and manager of instrumental conflicts on a TLE

Arnaud Zeller, University of Strasbourg

The research currently being conducted is in the engineering of Technology Enhanced Learning (TEL) and aims to understand the role and place of the Graphical User Interface (GUI) of the environment as an encapsulated system of instruments. In a cognitivist approach and based on the theory of conceptual fields of Vergnaud (1989), this research is situated within the general framework of the theories of activity and the instrumental approach (Rabardel, 2005). We use the HELICE model of Monique Linard (2001) which relates the double hierarchical and sequential management of the course of the action. In this model, the central role of the anticipated image of the goal and the evaluation tests play the role of a compass in the self-control of the action by comparing the expected effects with the results obtained. With reference to the concept of instrumental conflict (Marquet, 2011a), which brings into play didactic, pedagogical and technical artefacts within the learning environment, we seek to differentiate instrumented action schemes from use schemes which are mobilized by the learner from the graphical interface to carry out the learning activity.

The question we ask is the following: To what extent and in what way do the instrumental conflicts generated and managed from the graphical interface of the TEL impact the performance of the instrumented activity?

Our first hypothesis is that the learner performs on the same TEL more actions relating to the management of the interface, than the actions relating to the performance of the activity itself depending on the type of digital document it is accessing. Our second hypothesis is that these types of actions, which alternately mobilize instrumented action schemes and interface use schemes, create a conflict having the effect, at a pivotal moment, of increasing the number of actions falling under interface management, compared to the number of actions relating to the performance of the activity itself. And at least, we make the assumption that the learners who are the least subject to this imbalance between the type of task performed, obtain better scores.

Our observation methodology is based on learning analytics which allow us to collect the traces of the learner left on the TEL: DOCYRUS. This trace-based system is implemented in the environment itself while being transparent to the completion of the proposed learning activities: reading PDFs, writing, carrying out Quizzes. We carry out our research with students enrolled in the 2nd year in a course in strategic intelligence. We collect quantitative data exposed in the form of sequential logs dated and timestamped in milliseconds and relating to the nature of the action performed either by the learner or by the environment itself. We use IBM's SPSS software to perform descriptive and inferential statistics. We create a control group and an experimental group. The control group accesses PDF-type resource files while the experimental group accesses Word-type resource files (* .docx). The Quiz to be carried out using the resource files is identical for the 2 groups.

At this stage, it is not yet possible to present results since the research will start in early November 2020, but we believe we can establish a rough classification of instrumental conflicts by modelling the observed navigation routes.

References

Linard, M. (2001). Concevoir des environnements pour apprendre : l'activité humaine, cadre organisateur de l'interactivité technique. *Sciences et Techniques Educatives, Environnements interactifs d'apprentissage avec ordinateur - EIAO'2001, 8* (3-4), 211-238. Hermes.

Marquet, P. (2012b). eLearning et conflit instrumental : entre didactique, pédagogie et technique, *Recherche et Formation,* 68, 31-46.

Rabardel, P. (1995). Instrument, activité et développement du pouvoir d'agir. Dans Philippe Lorino et Régine Teulier (dir), *Entre connaissance et organisation : l'activité collective* (13., p. 251-265). La Découverte « Recherches ».

Vergnaud, G. (1989). La théorie des champs conceptuels. *Publications mathématiques et informatique de Rennes,* S6, 47-50.

Designing adaptive learning pathways based on the user's interest using interactive storytelling

Theresia Zimmermann, Dresden University of Technology

Telling stories has always been a fundamental part of human culture. According to Schank and Berman 'a story is a structured, coherent retelling of an experience or a fictional account of an experience' (Schank & Berman, 2002, p. 288). Since all stories are told with the intention to convey a specific message to the recipient, it can be concluded that stories have a 'didactic nature' (Schank & Berman, 2002, S. 288). If the story content is aligned to the interests of the recipient, the chances of perceived immersion may increase. Furthermore, interactive narration can help to see issues from different perspectives and enable knowledge transfer and situated learning. It can therefore be assumed that the imitation of an empathic narrator that considers the recipients preferences helps to create a better narrative experience and a more immersive way of learning.

Therefore, interactive storytelling might be used to develop adaptive learning pathways where learning content has been integrated into the narration. The learners are then able to choose a story line or rather a learning pathway that cater to their individual interests.

Different storytelling models have been investigated with regards to creating interactive narrations based on the user's interest. An important part is to identify the user's preferences regarding specific story content.

Nakasone, Prendinger and Ishizuka (2009) propose an interactive storytelling model using rhetorical structure theory (ISRST). The goal is to generate appealing stories by capturing interest through user interaction. To achieve this Nakasone et al. (2009) used an Interest Indicator Bar that allows the user to indicate their interest value regarding the story content by either wheeling the mouse up or down on the Interest Indicator Bar. Moving up means high interest and moving down indicates low interest (Nakasone et al., 2009, p. 667).

Garber-Barron & Si (2013) created an automatic storytelling system inspired by ISRST. This storytelling system aims to achieve a balance between novelty and topic consistency. The user is either presented content where they have already shown interest or material that might potentially trigger new interest. To capture which content is relevant for the user, the user can choose from different statements addressing the narrator. These statements are tagged with labels related to the story content, e.g. Fear or Love. Based on these labels a pre-defined profile will be matched with the user and builds the base for further story content recommendations (Garber-Barron & Si, 2013, S. 129f.).

The CHESS project by Pujol et al. (2012) also aims to develop an adaptive system which creates personalized narratives for each user - in this case each museum visitor. To evaluate the user's interest, they designed a visitor survey that helps to match the results with a predefined persona. The system can recognize changes in interest during the visit and adapts to the visitor profile accordingly (Pujol et al., 2012, S. 81).

Proceeding from these storytelling models a first prototype for an augmented reality app was designed that considers the user's initial interest and adapts to the user's potentially changing interest during the use of the application.

The purpose of this application was to raise awareness for the everyday life of the Jewish population of Dresden in the years before World War II. The prototype was then tested with university students with an academic background in history didactics. The initial results from this quantitative analysis suggest that users prefer an interactive narration that meets their personal interest. Regarding the implementation of this application that meant a mostly pre-determined narration where the user solely can influence the character's action while the general theme of the story remains. However, location-based narration might also be interesting for a more explorative way of learning about historical sites. For future research it might be thinkable to bring those two factors together and add further factors like time of day or prior knowledge to truly develop personalized learning pathways.

One approach might be to continue with historical sites as a learning environment. Another approach might be to explore a different learning environment, e.g. designing adaptive learning pathways for students of vocational schools since there might be the opportunity to get access to this area through a new project. Therefore, the research question is not finalised yet. For the time being, the research question is defined as follows:

> How can interactive storytelling support adaptive learning pathways for visitors of historical sites (or students of vocational schools)?

This leads to the following hypothesises:

1. Learners that can explore a topic in accordance with their interests are more motivated to learn than learners that receive pre-created learning material.
2. Learning pathways designed by using interactive storytelling are more immersive than learning pathways that are structured linearly.

References

Garber-Barron, M., & Si, M. (2013). Adaptive storytelling through user understanding. In: *Proceedings of the 9th AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment, AIIDE 2013* (pp. 128-134). Boston, MA: AAAI Press.

Nakasone, A., Prendinger, H., & Ishizuka, M. (2009). ISRST: GENERATING INTERESTING MULTIMEDIA STORIES ON THE WEB. *Applied Artificial Intelligence, 23* (7), 633-679. https://doi.org/10.1080/08839510903205423

Pujol, L., Roussou, M., Poulo, S., Balet, O., Vayanou, M., & Ioannidis, Y. (2012). Personalizing Interactive Digital Storytelling in Archaeological Museums: the CHESS Project. In: *40th Annual Conference of Computer Applications and Quantitative Methods in Archaeology (CAA)* (pp. 77-90). Southampton, UK: AUP.

Schank, R. C., & Berman, T. R. (2002). The pervasive role of stories in knowledge and action. In: Green, M.C., Strange, J.J., Brock, T.C. (Eds.) *Narrative impact: Social and cognitive foundations* (pp. 287–313). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Education & Technology - 13th edition

The Education & Technology Autumn School is an intensive seminar aimed at PhD students in Educational Technology whose researches are directed by founding members of the Education & Technology scientific network, and at former participants.

The theme of the current edition is « *Gamification, Artificial Intelligence and support to motivation* ». The scientific relevance and the innovative nature of this theme reside in the rising demands from companies or educational organisations for more sophisticated or spectacular eLearning products. Too often, this is made at the expense of motivation-inducing pedagogical scenarios and the analysis of users' responses & behaviours.

L'école d'Automne Education & Technology est un séminaire intensif qui s'adresse à des doctorants en technologie de l'éducation, dont les travaux sont dirigés par les membres fondateurs du réseau Education & Technology ou des anciens participants.

Le thème de la présente édition est « *Gamification, Artificial Intelligence and support to motivation* ». La pertinence scientifique et le caractère innovant de cette thématique résident dans les demandes de plus en plus fréquentes des organismes de formation ou des entreprises en direction de produit eLearning de plus en plus sophistiqués et spectaculaires, au détriment d'une scénarisation en soutien à la motivation, de l'analyse des réponses et du comportement des utilisateurs.

Die Herbstschule Education & Technology ist ein Intensivseminar, das sich an DoktorandInnen auf dem Gebiet der Bildungstechnologien richtet, deren Doktorarbeit von Gründungsmitgliedern des Netzwerkes Education & Technology oder von ehemaligen TeilnehmerInnen betreut wird.

Das Thema dieser Ausgabe ist « Gamification, Artificial Intelligence and support to motivation ». Die wissenschaftliche Relevanz und der innovative Charakter des Themas liegen in den immer häufigeren Anfragen von Ausbildungseinrichtungen oder Unternehmen nach immer fortgeschritteneren und spektakuläreren eLearning-Produkten (bzgl. Drehbuch, zur Unterstützung der Motivation, der Analyse der Reaktionen und des Nutzerverhaltens).

Université franco-allemande
Deutsch-Französische Hochschule

INSPÉ Institut national supérieur du **professorat** et de l'**éducation** Université de Strasbourg

With the support of the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission. Responsibility for the content of this publication (communication) reflects the views only of the author, and the Commission shall not be liable for any use of the information contained therein.

Atelier de recherche franco-allemand pour jeunes chercheurs soutenu par l'Université franco-allemande

Von der DFH gefördertes Deutsch-französisches Forschungsatelier für Nachwuchswissenschaftler

The aim of the German-French University (DFH/UFA) is to strengthen cooperation between Germany and France in higher education and research.

INVESTIR L'AVENIR