



TEACHING ADVANCEMENT AT UNIVERSITY (TAU) 2015/2016

E-learning: Context, design and implementation

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1 Flipped classroom and online learning environment

- Dr Lida Holtzhausen -

1.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Addressing the strategic priority of blended learning in the faculty of Arts, NWU Potch campus

Solution Creating an ideal flipped classroom to foster industry related skills

Practitioners 3rd year marketing communication students at the NWU NWU as an entity Academic services at the Potchefstroom Campus

1.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions Various applications of blended learning exist to facilitate the transition to online learning

Theory The learning environment will draw on theories of:
• Blended learning
• Online learning environments
• Design based research
The implementation of BL is based on the institution itself, teachers (lecturers), students and the pedagogy

Solution Learning environments need to be redesigned in order to address various learning skills and abilities in undergraduate students at the NWU, Potch Campus.

1.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles Developing an interactive platform served as a vehicle for blended learning

Implementation	Participants	Data collection	Analysis of data
2014 – 1 st implementation of e-fundi 2015 – 2 nd process of refinement and testing 2016 – 3 rd process of refinement	KCOM328 students in 2014, 2015 and 2016 Academic services Faculty of Arts NWU, Potch campus	2014 – focus groups and interviews 2015 – quantitative survey 2016 – quantitative survey and interviews	Statistical analyses and descriptive statistics for quantitative survey. Qualitative content analysis for interviews and focus groups

Design based research by means of cyclical testing between 2014-2016

1.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Continuous research will refine DBR application in KCOM328

Final design principles Equal blend of face-to-face interactions and technology in KCOM328

Dissemination Qualitative interviews to assess needs and re-evaluation of current platform. Continuous blend of face-to-face encounters and interactivity.

2 Creating a technology-enhanced learning environment for a short learning programme in choral conducting

- Dr Santisa Viljoen -

2.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Addressing the need for a paradigm shift in perceptions about technology enhanced teaching and learning environments in performance-based disciplines such as choral conducting

Solution Design a TELE the NWU-Choir Academy® SLP: *Introduction to choral conducting* which is both synchronous and asynchronous and allows for the convergence of face-to-face as well as distance learning.

Practitioners Focus group of 11 participants enrolled for a module in choral conducting; experienced choral conductors; IT specialists.

2.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions This project follows the theory of design-based research (Barab & Squire, 2009; Wang & Hannafin, 2005)

Theory The learning environment draw on principles of:
• Design-based research
• Blending with a purpose
• Flipped classroom approach
• Technology-enhanced learning
Creation of guiding principles
• participant's contribution
• collaborative learning
• reflective learning

Solution Created a TELE that is indicative of blended learning and a flipped classroom approach by using social messaging applications, voice over internet protocol and computer software.

2.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles Prior to implementation I already knew
• that I would use eFundi as LMS
• The basic requirements needed to design a TELE
• participants' needs, learning strategies and contexts

Implementation	Participants	Data collection	Analysis of data
Implemented and evaluated cycles using, e.g. online quiz & crossword puzzles, online forums, MP4 video participants' contributions to teaching-learning materials, YouTube, WhatsApp, questionnaires, observations etc.	7 enrolled for undergraduate module in choral conducting 4 enrolled for SLP in choral conducting 10 on-campus 1 distance learning Various levels of proficiency	Qualitative research Questionnaires Observations	Qualitative data analysis methods: Coding, categorizing, finding themes

2.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles The theories of DBR can be applied even more in order to successfully create a TELE that allows blended learning and a flipped classroom approach

Final design principles Important aspects of DBR that contributes to successful TELE allows collaborative learning, is inclusive (diverse methodologies, contexts, learning strategies), encourages social responsibility, is dynamic in nature.

Dissemination Develop the TELE even more to allow the necessary balance between time allocated for theoretical and practical work, using diverse social messaging applications, voice-over internet protocol, computer software and the LMS.

3 e-learning practices of 1st year Mathematics students

- Alfred Mnyvelwa Msomi -

3.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Use of technology in teaching mathematics to first year engineering students at MUT

Solution A learning environment created in e-learning platform using Khan Academy, you tube videos.

Practitioners Foundation mathematics students from the Department of Civil Engineering at Mangosuthu University of Technology.

3.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions Effectiveness of use of technology in teaching and learning of mathematics to foundation students.

Theory The learning environment will draw on theories of:
• situated learning,
• scaffolding
• cognitively guided instruction
Creation of guiding principles

Solution Access to support tools and just-in-time multi-media support.

3.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles Programme workload makes it impossible to address all the content misconceptions

Implementation	Participants	Data collection	Analysis of data
The project was done in three months period at MUT	35 foundation mathematics students in the Department of Civil Engineering.	Questionnaires Focus group interviews	Analyse the quantitative data statistically.

3.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Use of e-learning models in T&L of mathematics

Final design principles Interactive lesson using technology platform

Dissemination Research findings and framework will be published in journals and conferences

4 M-learning in the off-line mode for science

- Prof Sarah Jane Johnston -

4.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Rising costs of broadband and full-time study requires an efficient off-line mobile learning platform

Solution Creating an off-line application that is platform independent for distance education students in higher education in the sciences to enable cost-effective learning on the go

Practitioners Lecturers at Unisa ICT services at Unisa

4.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions Design an off-line mobile application that is platform independent that will allow efficient m-learning as a supplement to distance learning

Theory The learning environment will draw on theories of:
• Open Distance Learning
• Mobile learning pedagogies
• Moore's theory of Transactional Distance

Solution Easy mobile applications can be designed for off-line access to supplement currently learning.

4.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles Developing an off-line platform-independent mobile application for an ODL teaching and learning

Implementation	Participants	Data collection	Analysis of data
Researching the pedagogies and then the development of mobile application	Lecturers at Unisa ICT services	Consideration of relevant literature	Relevant literature consulted and implementing mobile education and distance education pedagogies

4.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Pedagogically sound mobile applications

Final design principles The results will be part of a Master of Education dissertation and eventually will be published in an ISI journals

5 Designing for transformative learning in technology-rich and technology-constrained higher education contexts in South Africa

- Dr Rita Ndagire Kizito -

5.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem A lack of pedagogical models to galvanize curriculum development for student-centred, blended and online learning environments.

Solution Identify relevant interrelated course design principles required to inform the course design process and try them out in real design environments.

Practitioners Groups of academics from different faculties and academic developers from the Centre for Teaching, Learning & Media

5.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions Collaborative course design principles modelled after Salmon (2013) Carpe Diem learning design process.

Theory The learning environment will draw on theories of:
• Transformative Learning Theory
• Humanising Pedagogy
Creation of guiding principles

Solution To try out a set of interrelated course design principles grounded in transformative learning theory, and anchored in Carpe Diem learning design process. The design principles have been tried and will continue to be tried in different workshop settings.

5.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles The workshop process is run and its impact on subsequent learning design practices studied.

Implementation	Participants	Data collection	Analysis of data
Using a design-based research methodology in the re-conceptualisation of course design for transformative learning.	Academics from different faculties and academic developers	Survey questionnaires, interviews and development of design artefacts	Constant comparison method until themes emerge

Collaborative design, authentic, complex tasks, scaffolding

5.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Collaborative course design framed in a Humanising Pedagogy framework

Final design principles A learning design based on transformative learning, Humanising Pedagogy framework and the Carpe Diem Learning design process.

Dissemination Conference proceedings

6 Radiation safety regulations in a flexible learning

- Dr Belinda van der Merwe -

6.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Radiography students spend weeks off campus at hospitals during work place learning and must apply theory of radiation safety in order protect self as well as the patient.

Solution The design of learning and assessment tasks so that meaningful learning will take place outside the lecture hall, in clinical practice.

Practitioners Experts in the field of radiography including physicists and radiography lecturers and an instructional designer.

6.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions

Theory The learning environment will draw on theories of:
• Situated learning
• Authentic learning and assessment
• Technological affordances

Solution In designing of e learning activities it is not sufficient to only provide examples from real-world situations to illustrate concepts but the purpose and motivation for learning must be provided.

6.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles Student activities are delivered to students in practice during the clinical placement weeks via WhatsApp. After a week a response is required via QuestionPro.

Implementation	Participants	Data collection	Analysis of data
2015 Delphi survey to determine content.	10 Experts for Delphi	Interactive student activities via Question Pro	54% of students utilised both cell phone and email to respond, 93% indicated that the instructions were clear.
2016 Delivery of activities via cell phone	54 second year students 55 third year students	Student satisfaction survey	

6.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Reflection suggested that content must be divided in manageable units and delivered to students in clinical practice.

Final design principles Provide authentic learning activities and assessment to reflect on knowledge used in real life.

Dissemination The content of the radiation safety course was converted to be suitable for a website that is accessible with a mobile phone. Students are engaged to apply theory in practice.

7 Blended learning for first year organic chemistry

- Dr Lynne Pilcher -

7.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Large classes limit meaningful formative assessment and feedback; and result in anonymity of students and hence poor motivation and engagement.

Solution Design a programme that uses the McGraw-Hill online assignment platform blended with face-to-face tutorials.

Practitioners •CMY 127 Organic Chemistry course lecturers and tutors,
•CMY 127 Students (Classes of 2015 and 2016),
•McGraw-Hill representative.

7.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions Enhance student engagement by requiring time on task alternating between online and face-to-face tutorials.
Make use of the on-line assignment tool to...
1. enable real time electronic individual feedback on different levels,
2. cater for different learning preferences and allow flexibility in time and place.
Use face-to-face tutorials to ...
1. enable peer learning and feedback,
2. give additional personal instruction.

Theory Our understanding of how students learn draws on:
• Feedback (Boud and Molloy)
• Engagement (Chapman)
• Blended Learning (Garrison and Vaughan)
• Activity Theory (Engestrom)

7.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles The blended tutorials will be implemented in the first year, second semester General Chemistry module CMY 127 during the second half of the module.

Implementation	Participants	Data collection	Analysis of data
2015 – Pilot study This included the first implementation of the McGraw-Hill Connect platform. 2016 – Full study to come.	2015 – CMY 127 students & lecturers 2016 – students, lecturers, tutors. Researchers from Education Innovation & Statistics	Pre- & Post- course surveys; Student marks; Focus group interviews	The pilot study was too small for full statistical analysis. Results indicated there was no disadvantage to replacing some face-to-face tutorials with an online assignment.

7.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Reflection suggested that we could learn from interrogating changes in students learning preferences based on their face-to-face and online experiences.

Final design principles Each component of the programme should be used to optimum benefit to enhance engagement and feedback opportunities. We note that different components of the curriculum may be served differently by each learning modality.

Dissemination The second round of the implementation will form part of a full education research study, which will be published in an ISI journal. This will fulfil the TAU ideal to enhance the scholarship of teaching and learning.

8 eLearning: Context, design and implementation

- Group 8 – final synthesis -

8.1 Analysis of practical problems by researchers and practitioners in collaboration

Problem Need for designing and implementing context-based technology-enhanced learning environments

Solution Designing and implementing TELE, allowing participants access to flexible learning opportunities and industry related knowledge and skills

Practitioners Educational developers, disciplinary and IT specialists, academic staff, students

8.2 Development of solutions informed by existing design principles and technological innovations

Design & development of possible solutions All projects followed DBR principles

Theory The learning environment draw on theories of:
• Blended learning
• Situated learning
• Cognitive guided instruction
• Experiential learning
Creation of guiding principles:
• Collaborative learning
• Reflective learning
• Context based learning

Solution Designed, implemented and researched context-based TELEs in respective disciplines

8.3 Iterative cycles of testing and refinement of solutions in practice

Implementation & evaluation cycles TELEs were researched and implemented over varying periods of 4 days to 12 months, using groups differing in size

Implementation	Participants	Data collection	Analysis of data
TELEs were researched and implemented over varying periods	Participants included students, academic staff members, IT specialists and professionals in various disciplines	Literature reviews, observing and interviewing participants, questionnaires, surveys & students' results	Qualitative & quantitative data analysis, descriptive stats, coding, categorizing, thematic analysis, learning analytics, narrative analysis

Draft design principles: reflections, authentic learning, social responsible pedagogy, accommodating diverse proficiency levels of students, engagement, student participatory parity

8.4 Reflection to produce “design principles” and enhance solution implementation

Design Principles Utilising DBR to enhance collaborative TELE research

Final design principles Creating flexible and interactive participatory environments using authentic and context based tasks of appropriate complexity

Dissemination Results will be made available as e.g. course content, publications in journals, conference papers and post-graduate qualifications.

Conclusion DBR gave Group 8 a common language to engage with their different disciplinary T&L contexts and provided a framework for the research process

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