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Fieldtrip in a classroom: enhancing student diversity and inclusivity with the use of vPike

Faculty of AgriSciences | Department of Conservation Ecology and Entomology

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Learning activity:
Virtual fieldtrip

Learning technology:
vPike

Context

Background overview

The department of Conservation Ecology and Entomology at Stellenbosch University offers a 4-year professional undergraduate degree. Students who elect to take third year Conservation Ecology join the department in the second year of their BSc studies. In 2014 the Department was home to 150 students, including undergraduate-, postgraduate students and postdoctoral fellows. A staff complement of 11 academics and several external experts contribute to the teaching and learning of the undergraduate teaching programmes.

Students are predominantly English and Afrikaans first language speakers, with approximately equal number of males and females represented in the undergraduate classes. Historically, classes have comprised between 95 – 100% white students. The case presented here addresses an alternative approach to the lack of student racial diversity in the classroom. The student population includes international students from such countries as the United States of America, Belgium, Germany, Canada and Peru. The presence of these international students, enhances student diversity.

Subject area

The third year Conservation Ecology module is entitled Introduction to Conservation Management. This module includes a range of topics pertinent to conservation science and practice, including environmental policy formulation, community based natural resources management, and, with reference to this case, environmental sociology.

Established practice

Modules are typically presented in 50-minute lectures offered three times per week and one 3-hour practical once a week. Lectures are conventionally classroom based, and practicals constitute outings, group work in class or other activities that promote practical application of theoretical aspects covered during lectures.

The challenge

The Department of Conservation Ecology and Entomology is committed to diversify its student profile. This commitment rests on several premises:

- Stellenbosch University brands itself as an inclusive intuition of academic excellence, situated in a culturally diverse area of the Western Cape;
- social-ecological systems include a diversity of social actors, all of whom should be represented in the science and practice aimed at conserving precious resources;
- the University and the Faculty have set strategic goals to realise a more diverse student complement representative of the national population; and
- biodiversity conservation requires a diversity of ideas and ways of thinking to tackle the complex issues we face in a South African society.

Strategies have been devised and operationalized to address the lack of ethnic diversity in the Department. Results have been slow, but promising, with the largest intake of black students to date having been achieved in 2013 and 2014. While the department continue to invest in these longer term strategies, the lecturer of the third year, Conservation Ecology module aimed to make use of existing diversity amongst students in the third year class. The idea was to take a step back from the obvious racial diversity imbalance, and focus on other measures of diversity that could be used in the classroom to enhance teaching and learning.

During a departmental reflection session in November 2012, members of the teaching programmes constructed a list of graduate attributes that they felt the students should leave with by the time of their graduation. Based on the lecturer's university experience, she have always held that student diversity in the classroom enhances peer learning, and opens up channels of thinking and dialogue that may otherwise be missed. With a class of predominantly white students, it was obvious that racial diversity was limited. Faced with this reality, and with the acceptance that transformation in that visible sense might be slow, she applied her mind to other forms of diversity. The lecturer started to identify how students are different from each other, and realised that this cohort of white students is of course not one homogenous group of people.

In her deliberate search for alternative measures of diversity, the lecturer realised that her students have different takes on their natural environment based on, amongst other things, where they grew up. It was clear from a first assignment – an expository essay on environmental ethics – that students felt strongly about the natural environment. For many of them

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Learning activity:
Virtual fieldtrip

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the choice to embark on this particular career path seemed to be inspired by their value of nature and biodiversity. Therefore, the lecturer wanted them to share the stories of their own constructs of "the environment" as an introduction to one of the modules in the Introduction to Conservation Management course.

Possible advantages associated with the integration of technology

The lecturer looked up where students were from on the class list, and selected students who were diverse from the majority in the class, either by virtue of their geographic location, ethnicity, religious or cultural background (rural or overseas, etc.). With the student's permission, the lecturer used vPike to "visit" the street of the student's community, suburb, region, etc. vPike is an online geographic mapping and navigation tool that makes use of street views.

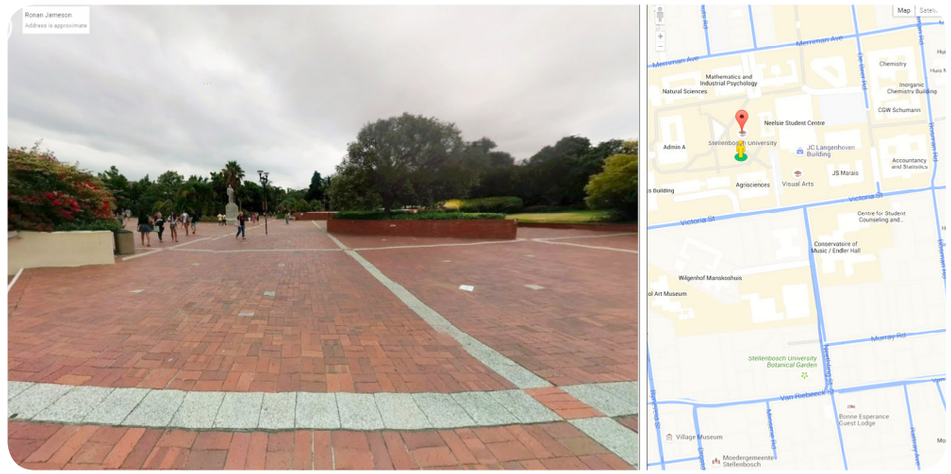
Learning activity

With the use of VPike, the lecturer is able to take the students on a "fieldtrip" around the world or around the country to visit each other's areas of origin, right up to their street. The student is asked to give a brief intro on their community, environment and their local resources. These terms are then unpacked as the introduction to the module where it is examined how these concepts mean different things to different people. The series of lectures are shaped around the responses in the class, and according to the contents of the yearbook and pre-selected readings.

The advantage of using vPike as education technology is that the students are able to engage with personal stories of each other's experiences of their "environments". This can be done in 50 minutes, with different people volunteering information and stories. They are able to build a mosaic of "the environment" and it creates the impetus to critically examine social constructs of social and ecological components of social-ecological systems.

Learning environment

The activity took place in a conventional lecture theatre. Two project screens with clear resolution were used, and the internet connection was fast enough to facilitate seamless "travel" between sites.
VPike (www.vpike.com) is used as a tool for learning. vPike provides Google Street View, area photos, local traffic conditions, a map measurement tool and driving directions. It allows the learners to engage in a completely new learning environment.



Student experience

At the end of the class students were asked how they liked this novel introduction to the module. They responded positively. They raised the following points:

- "It's a good way to see where other students grew up."
- "I enjoyed having to say something about my area."
- "It made me miss home!"

General

Opportunities

The following worked well during the learning experience:

- The online platforms allowed students to "visit" each other's hometowns and ask questions about what they could see visually of the "environment": e.g. a farm, a suburb, etc., a nature reserve, an informal settlement or industrial area.
- Students were able to ask questions of the person whose area they were visiting about parts of the "environment" that they could not see: e.g. social institutions, labour and sources of primary production, community structures.
- Students' peripheral to the norm in the class had an opportunity to

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Learning activity:
Virtual fieldtrip

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vPike

share their perspectives and show the class the alternative or similar perspectives they feel they represent in the class.
- It was also an opportunity to get to know each other, to reflect on the diversity amongst us, and how that diversity shapes how we see the world as citizens, as conservation practitioners and as graduates.

Challenges and advice

It is necessary to ask prior consent of students whose streets are visited, as students may feel targeted or less inclined to share their places of origin in this sort of setting. Only students who volunteered the information were asked to share their environment.

It is important to facilitate the process so that students understand the purpose and the follow-up to the exercise as a learning activity relevant to other subject matter. The following three questions act as guide for any student who volunteers for the class to visit their street:
"Tell us about your environment."
"What can we ask about the environment that we cannot see?"
"What is one of the most pressing environmental issues in the area where you grew up?"

Concluding thoughts

Deliberately seeking out diversity amongst what might seem like a homogenous group of students is a refreshing experience. The new perspective has lead the lecturer to consider other ways of using existing diversity in the classroom to enhance graduate attributes amongst our students. Diversity in the classroom can be promoted in several complementary ways that has to lead the student to reflections on policy formation, and participation in community conservation projects and research. Online technologies can transport the students to different places in a matter of seconds, and at no great cost. It does not replace a fieldtrip, but for the modest purposes explained here, it may be a worthwhile consideration for exploring new places, and new ways of teaching and learning that excite, inspire, and promote student inclusiveness in a diverse university setting.

Improving teaching productivity and learning efficiency using online assessments and clickers

Faculty of AgriSciences | Department of Forest and Wood Science

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Learning activity:
Improve teaching productivity and learning efficiency

Learning technology:
Clickers, online assessments

Context

Background Overview

The Department of Forest and Wood Science has developed a number of blended learning courses over the past decade. The objectives for using blended learning varied with the different courses. In 2004 a blended learning forest engineering course was developed which formed part of the undergraduate programs of forestry at the University of Stellenbosch, the NMMU forestry program in Saasveld, and the forestry program of Freiburg University in Germany. This was part of the PhD project of a student to evaluate the efficiency of this type of learning. From 2006 to 2009 seven blended learning Wood Products Science courses were developed in co-operation with the University of British Columbia, Canada. The main objective of this project was to allow part-time industry learners to enrol for these under-graduate courses. Courses consisted of a 3-month online theoretical component and a one-week practical period on the campus.

Possible advantages associated with the integration of technology

The latest blended learning development in the Department is a project to increase the use of online assessments and in-class clicker assessments in a number of the modules. This project has been running from 2013. The motivation for using these assessment methods differs for each lecturer, but the following are the major reasons:

- Improving teaching productivity
- Improving learning efficiency
- As a normal student assessment method (to grade students)

For the department teaching productivity was especially important as the lecturers have very high teaching loads per lecturer but they do not want to reduce the number of modules that they present.

Project progress

The first module for which on-line assessments were developed was Wood Products Science 414 in 2013. The assessments consist of a weekly quiz for the full duration of the module over one semester. Since then assessments were developed for 5 other modules in the department. In 2014 the department purchased 40 clickers and for some modules the on-line assessments were changed to clicker tests that were completed in the class.

Project results

Improving teaching productivity

Teaching productivity was improved in two ways. Firstly, for some modules with very good self-study resources, the number of classes could be reduced. For instance, in the Wood Products Science 414 module the classes were reduced from 3 per week to 1 per week for a large part of the semester. Every week students were then required to study a certain section of the work themselves and write an online assessment or quiz on that work during the first 10 minutes of class in a computer use area. The remaining 40 minutes of the class were used to review and discuss the work for the week. The online assessments were later replaced by clicker assessments which meant that classes did not have to be in a computer use area. The time spent on class-room teaching was reduced by 67% per week for this module (not all weeks).

The second way that teaching productivity was improved, was the reduction in the time required for assessments. With normal tests, the printing, marking and capturing of marks take up quite a lot of time – even if it is only a quiz. With both the online and clicker quizzes marks were automatically captured for students.

Improving learning efficiency

Learning efficiency was improved in several ways.

- The regular assessments of students give timely indication of how well

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Learning activity:
Improve teaching productivity and learning efficiency

Learning technology:
Clickers, online assessments

students understand work. In the case of Wood Products Science 414 a review class followed every assessment. Since results were immediately available, the lecturer could then spend more time on sections where students did not perform that well.

- In some classes, such as Forest Science 171, clicker assessments were used to gauge how well students understand concepts that were just explained. If the assessment showed that a significant number of students did not understand the work, the lecturer could spend more time on explaining it. In this case assessment marks were not captured.
- Where assessments were captured every week such as with Wood Products Science 414, the students continually get results throughout the semester and know when they need to spend more time on the module.
- The weekly self-study section and assessment that preceded the review class in Wood Products Science 414 ensured that the review class and discussion was productive and time could be spent only on problem areas.
- Weekly assessments that were captured and count towards the class mark of the students forced the students to work regularly throughout the semester.

As a normal student assessment method (to grade students)

For some modules the online and clicker assessments counted towards the final mark and were a way of evaluating and grading a student.

Student feedback

Student feedback on the two modules where assessments were already regularly used over the last three years was extremely positive varying between 79% and 85%. In all cases the student comments were positive about the self-study method and some students noted it as the best aspect of the module. There were mixed feedback regarding regular quizzes. Some students noted it as the best aspect of the module whereas others thought it was too short and not enough time were allowed for its completion. The format, time and length of quizzes were adapted over time to improve its efficiency and lecturers are still trying to improve this aspect.

General comments

Blended learning using a combination of self-study and online assessments significantly improved the teaching productivity and learning efficiency of the modules where it was used. However, to set up a module for this type of teaching was very time consuming in the beginning. Very good self-study material such as class notes, handbooks and in some cases multimedia material was required. Initial setup of quizzes was also quite a lot of work. Fortunately, the lecturers were supported by their faculty who funded some of the setup costs.

Blended Learning – A 'flipped' approach in Sociology

Faculty of Arts and Social Sciences | Department of Sociology

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Learning activity:
Flipped classroom

Learning technology:
Podcasts, discussion forums

Context

Background overview

The Department of Sociology describes itself as a dynamic research focused unit. Its programme offerings encompass a wide spectrum of local and international issues such as poverty, development, globalization and inequality. The department prides itself on producing graduates who are capable of high-level theoretical and analytical processing skills.

The course under investigation is a third year political sociology module attracting a heterogeneous student cohort of about 100 students. There is one academic and seven student facilitators.

Topic

Professor Heinecken describes her module as dynamic and exciting. Due to the topic nature of her module, references are made to concepts such as 'power, government and the state', 'governance and civil society', 'protests and social movements' and 'power beyond the rules'.

Learning and assessment activities

Educational approach

Having been a participant in the Centre for Learning Technologies' blended learning short course, Professor Heinecken decided to make use of podcasting as a strategy to enhance her teaching and learning practices. Initially she made podcasts of all her lectures. She reasoned that students could utilize these podcasts for revision purposes or if they missed out on lectures. However, after consultation with the Centre for Learning Technologies, she was advised to adjust her pedagogy towards a form of blended learning known as a 'flipped classroom'. This form of blended learning is described as the thoughtful fusion between face-to-face interactions and podcasting (McHaney, 2011).

Traditionally lectures are used for content dissemination. Ideally, provision should also be made for class discussions. Depending on the dynamism of the lecturer and time constraints, there may be instances where little emphasis is placed on the creation of deliberative spheres of engagement.

To circumvent this problem, lecturers, such as Professor Heinecken, are now implementing 'flipped classroom' pedagogies. In a 'flipped classroom' a lecturer produces short podcasts covering key concepts that would otherwise take up large portions of time in a lecture, leaving little time for student interaction. Students are required to watch these podcasts before coming to face-to-face sessions. Consequently students come to class better equipped to engage in discussion and apply concepts they have internalised through watching these podcasts. This pedagogy therefore allows for the development of high-level theoretical and analytical processing skills.

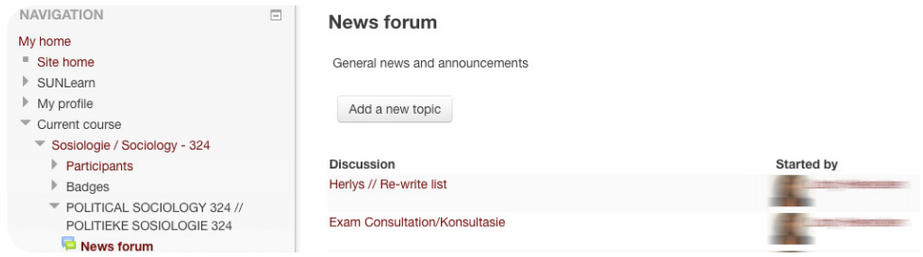
As with any course, there are concerns regarding class attendance. Initially this was a problem for Professor Heinecken as her podcasts were recordings of entire lectures. Consequently, students did not feel the need to attend lectures, as they could catch up with work at their own time. However, through effective implementation whereby students were granted access to the aforementioned short podcasts, class discussions were fostered that also resulted in an increase in class attendance. Many students embraced such a transformative approach to learning and subsequently student passivity changed to active engagement with the course content.

The challenge

According to Professor Heinecken, most of her students have embraced this 'flipped' based pedagogy. However, a few students found it difficult to adapt to this pedagogy. These students have indicated that they still prefer passive modes of delivery despite the creative changes actuated by the lecturer.

Learning enviroment

Due to course resources such as podcasts and articles, stored on SUNLearn, learning has not been confined to brick and mortar solutions. The learning management system facilitates the development of asynchronous learning environments supplemented by class discussions



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Learning activity:
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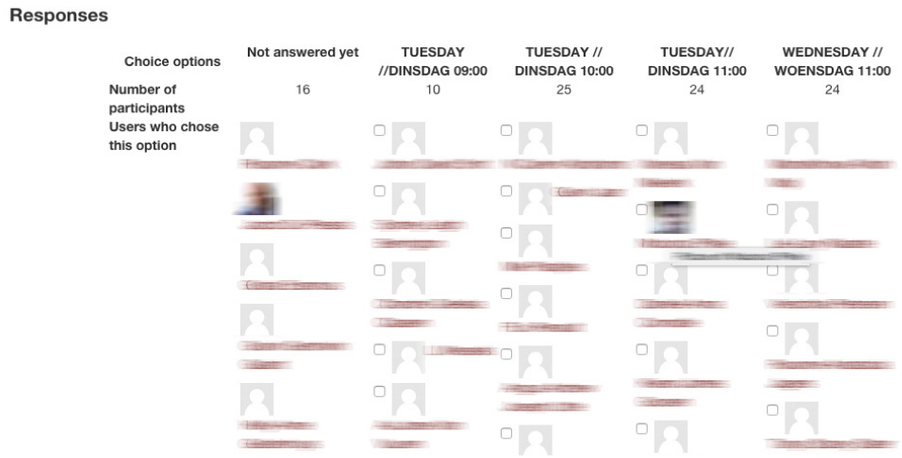
Podcasts, discussion forums

and SUNLearn chat forums. Students also learned collaboratively by engaging in tutorial groups.



Student experiences

Adopting a 'flipped' based approach may require a pedagogical shift. For years students were perhaps subjected to passive modes of course delivery. With 'flipped' based initiatives students are required to take responsibility for their own learning. Although many students have embraced this new style of teaching and learning, some remain hesitant towards its application. Additionally, students have pointed out that they no longer feel pressured when taking class notes. International students have also pointed out that the use of podcasts in this blended mode of delivery has assisted them in overcoming language barriers.

Conclusion

Careful research and consideration should be taken into account when introducing a new educational technology. Each context is invariably unique as Professor Heinecken discovered during her initial adoption and the problems that subsequently arose. Professor Heinecken will now be working closely with the Centre for Learning Technologies' advisors to refine her current blended learning initiatives. Through this collaboration she will be provided with assistance in the use of tools such as CMAP tools and Camtasia studio to develop her course content and assessments towards a truly blended mode of delivery.

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Transforming Economics 144 away from traditional teaching towards student centred learning

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Learning activity:
Flipped classroom

Learning technology:
Clickers, vodcasts

Context

Background overview

As the largest faculty (in terms of number of undergraduate students) at the University of Stellenbosch (US), Economic and Management Sciences are faced with unique challenges. These challenges are related to the lecturer-student ratio, the pressure on staff time, keeping the success rate, enhancing the quality of graduates and improving both the student and lecturer's overall teaching and learning experience. Technological development and associated advances in knowledge regarding the use of technology in teaching and learning provide multiple opportunities to address these challenges. For this reason, enhancing the use of learning technologies is prioritised within the faculty.

Intended learning outcomes

Upon completion of the module students should have a thorough knowledge of the basic macroeconomic concepts and should be able to analyse the macroeconomic issues from the perspective of different schools of thought in economics. Students should also be able to apply their knowledge in understanding South African macroeconomic issues, such as economic growth and development, inflation, unemployment and balance of payments stability.

Established practice and subject area

Economics 144 (Macroeconomics) is a second semester module that follows on Economics 114 (Microeconomics). The module has six lecturers and therefore six groups of students that attend either Afrikaans or English lectures. Economics 144 is an introductory macroeconomics module that focuses on several areas, including the theory of income and production determination, the foreign sector and monetary economics. The theory is illustrated using South African data and examples throughout the module, to give it a South African perspective.
Lectures focus on a framework for the particular topic as well as the context within which it should be studied. Students are expected to prepare for each lecture by reading the relevant sections in the textbook. During the lectures the material is placed in context and the more difficult parts of the work is emphasised.

The challenge

In spite of the lecturers' best efforts to incorporate discussions and excellent presentations in lectures, running a comprehensive, efficient tutorial programme as well as having a summer school in place they were still frustrated with the lack of student engagement and success over the past couple of years. Although the summer school has led to an average improvement of about five percent in the pass rate over the past five years, the pass rate is still on average only about 75%. The quality of these passes is also not what they would like it to be – on average only 8,8% of students achieved distinctions over the past five years. This motivated the lecturers to rethink the mode of delivery of the Economics 144 module.

Possible advantages associated with the integration of technology

The body of higher educational literature clearly shows that active, student-centred learning methods outperform traditional models in terms of effectiveness, also in teaching economics. Inspired by a colleague's positive outcomes in chemistry using a collaborative, problem based model, the lecturers successfully replaced the lecture approach with this student-centred approach during the winter school for Economics 114 in July 2011 and July 2012. These successes gave them confidence that a student-centred, collaborative learning approach is possible for large class groups.

Student overview

There were 1 863 first year students registered for Economics 144 in 2014. These students are divided into six groups. Towards the end of Economics 114 (first semester module) students were given the option to enrol for the project in the second semester. Two groups (one Afrikaans group and one English group) were taught under the project. A total of 427 students enrolled for the project.

Learning and assessment activities

Educational approach and learning activities

The aim of this project was to pilot a reshape of the Economics 144 module to become truly student centred and aligned with the graduate attributes of the university. The lecturers aimed to show that cooperative problem-based learning is possible (and in fact more successful than the traditional approach) for large class groups in economics by flipping the classroom

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Learning activity:
Flipped classroom

Learning technology:
Clickers, vodcasts

(of two of the six lecture groups) in 2014 – incorporating high and low technology in a blended learning approach to facilitate and enhance engagement and monitoring attendance, participation and progress of the students.

The lecturers assessed, reviewed and improved the content material, questions to be used for problem based sessions, equipment and logistics before the commencement of lectures in July 2014.

Students attended lecture sessions in six groups of which two (one English and one Afrikaans group) piloted the new approach. Each of these two groups was divided into small groups of three – but later in the term the groups ranged in size from groups of two to five, due to some students not attending classes. Students remained in these groups for all contact sessions as far as possible. Full class attendance was required (and explicitly mentioned in contracts with these students). During the term, however, when students wrote tests (for other subjects) many students missed classes – for example during a week when three tests were scheduled, there were only 80 (out of 250 students) students present in class. Although students had agreed to attend all classes (and signed a contract stating this much), the lecturers could not enforce class attendance.

In order to monitor class attendance a combination of methods were used: registering with smart phones on SUNLearn with student numbers and submitting answers to objective questions; handing in of homework; writing a spot test; submitting of group assignments; signing of a register but then validated by a head count and more.

To facilitate the problem based peer instruction approach in class, both low tech and high tech equipment were used. Students used their cell phones as clickers and were then able to individually indicate his/her answer(s) to the problem(s) stated. Groups got the opportunity to discuss the question and indicate their answer to the lecturer using the low tech clickers (LTC) (flash cards) and if necessary using the low tech tablets (LTT).

After discussion students got the opportunity to then again use the "clickers" to indicate their final answer. The high tech equipment (cell phones as clickers used with software on Android Tablet) allowed data to be captured on each question posed and the learning that then takes place can be measured. It also generates immediate feedback for students that enhance learning. The low tech equipment enabled the lecturer feedback on who the students with problems are and leads to some (healthy) competition in the classroom.

Assessment activities

Students were still only assessed on the three semester tests and examination as in the previous teaching model. As part of their preparation activities they did answer a short quiz but these were not assessed. In class they took part in group work and answered questions using clickers and mini-whiteboards. These in-class activities were also not assessed.

Feedback practice

Students received immediate feedback on their in-class activities from other students and the lecturer. Students wrote the same semester tests as those not in the project group, and received feedback two weeks after the tests.

Learning Environment

Learning setting

Learning took pace in traditional lecture halls. The outlay of the lecture halls did not prove conducive for flipped classrooms. Furthermore, the Wi-Fi rarely worked in some of these buildings. This proved a great challenge for the lecturer since their approach relied heavily on technology for the

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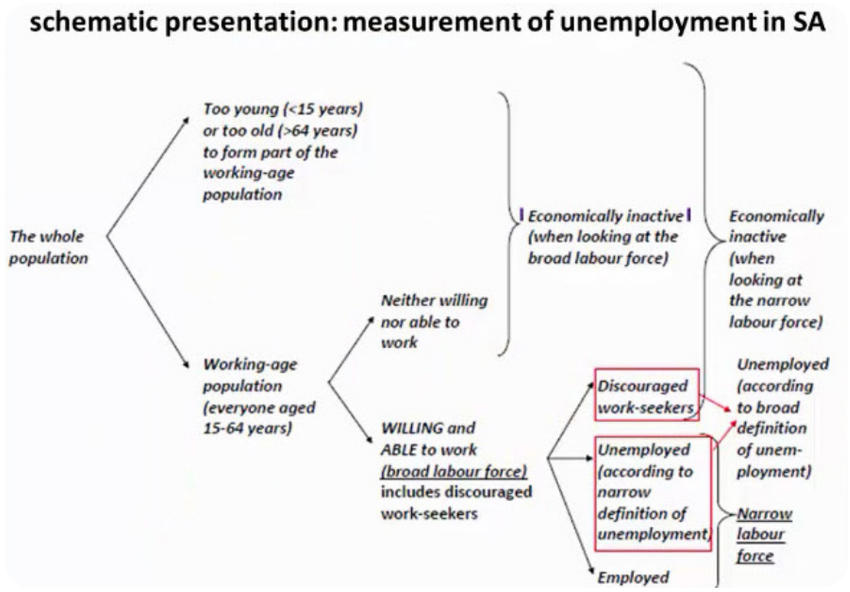
clicker activities. Students had to use their own data or write their answers on paper.

Collaborative settings

Students worked collaboratively in groups in lectures. These groups had two to five members. To create the groups at the start of the module proved to be a big administrative task. Students also did not always attend classes which proved more difficult for group work.

Content resources

Students still had access to the traditional module content on SUNLearn. The text book was also recommended to the project group. On SUNLearn, lecturers posted their own vodcasts or links to Khan Academy videos for students to watch as a preparation activity.



In the feedback students stated that they preferred watching the lecturer's vodcasts instead of other videos.

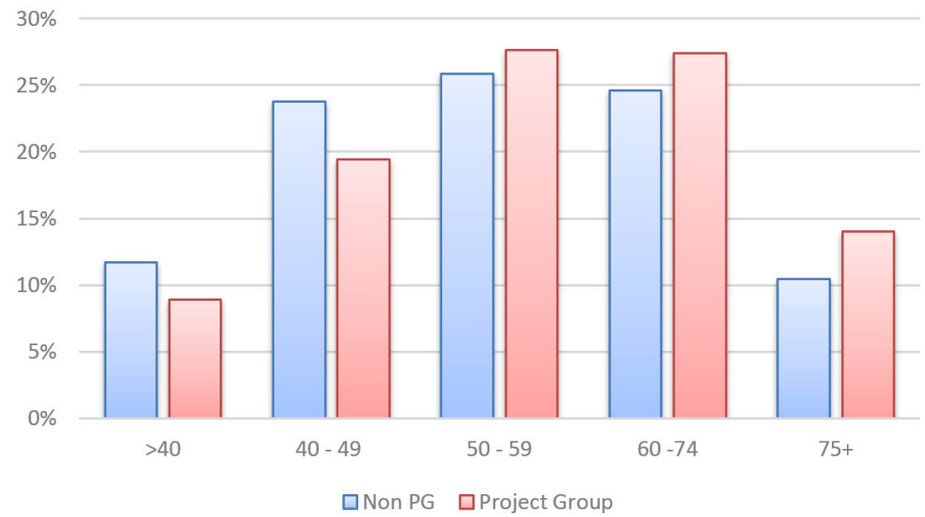
Student experience

Student feedback on learning experience

Students completed questionnaires at the end of the module. Almost all (94%) of students stated that the videos helped them understand economic concepts better. A large part of the class (77%) found clickers useful. Less students, but still a significant amount (66%), found the low tech clicker (colour flash cards) effective. Students (82%) that working in groups helped them learned better and 86% felt that they are more prepared for the examination.

Assessment impact

From the predicate marks it emerges that overall the Project Group students have a higher predicate. Therefore, the use of flipped classroom had a positive impact on the students' assessment.



General

Opportunities

Once the project is securely in place, it will be easily duplicated in future years. The initial inputs and expenses will therefore benefit students (as well as lecturers) for this module in future years. As designers of the project, the lecturers are keen to find a workable model that they will definitely also apply to other courses and will continue to measure and report the outcomes. Through sharing the results and model, lecturers hope to help in revolutionising the mode of instruction for large class groups worldwide.

Challenges

The lack of Wi-Fi were challenging in most lecture halls. Since lecturers

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were dependent on the use of online clickers at the beginning, the method of teaching had to be adapted.
There are tests banks available in English, which made setting up questions easy for the English lecturer, but the Afrikaans lecturer had to translate many multiple choice questions into Afrikaans, which was very time-consuming.
The large class size (specifically in the English group) made it difficult for the lecturer to answer each group's questions during class. Next year there will be two teaching assistants (Master's students) present during every class.

Advice

The lecturers have the following advice for colleagues that wish to engage in a flipped classroom:

- Make ALL the vodcasts (videos) available BEFORE the start of classes. During the semester unforeseen circumstances arose, and there were some weeks that the lecturers could not record and produce the vodcasts.
- Plan each week's activities, and give a week by week plan to students so they know what to expect in terms of videos to watch, question sets etc.
- There may be trade-offs in terms of content covered during class. This content needs to be in vodcasts for students to watch, or students will have to read more. The objective, however, is to do more problem sets/ question sets during class, so that students truly learn by doing.
- Provide as much feedback to students as possible – they learn by doing, seeing (understanding) what they do wrong and then being able to correct it. Keep the students engaged!

Other concluding thoughts

This project was funded by the RDF (Finlo and Teaching Development Grant).

A reflective e-portfolio: enhancing theory application using Mahara

Faculty of Economic and Management Sciences | Department of Industrial Psychology

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Learning and assessment activity:
e-Portfolios

Learning technology:
Mahara

Context

Background overview

Industrial Psychology 152 is presented in the Department of Industrial Psychology. Three hundred first year students are enrolled for this course. The students attend either Afrikaans or English lectures. These students are from various programmes, including: industrial psychology, business management sciences, human resource management and philosophy, politics and economics (PPE).

This module is entitled Occupational Psychology and covers domain demarcation, core concepts and fundamentals of the topic, individual differences and developmental psychology. After completion of Industrial Psychology 152 students will possess thorough knowledge, ability and affective orientation of Occupational Psychology in the South African work environment. Students should know and be able to apply the principles of Career Psychology at all the levels of the cognitive and affective objectives of education as adapted from the taxonomy of Bloom as well the 8 critical outcomes as required by the SAQA.

Established practice

This course is presented in the second semester to first year students in Afrikaans and English. During the third term students attend two lectures per week and during the fourth term only one lecture per week. There is also practical sessions and an online practical assessment. Students are assessed on their practical session work, tests and the examination opportunity at the end of the semester.

The challenge and possible advantages associated with the integration of technology

The module is very content-heavy, although the content is not difficult. The lecturers feel that although students can pass the module by only studying the text book, this does not allow the students to engage in deep learning. By encouraging students to actively reflect on the work and engaging in the application of theory, students are involved in deeper and more active learning. The lecturers also hoped to improve class attendance through this activity.

Other relevant role players

Industrial Psychology honours students acted as assessors for the e-portfolio entries. The fact that the honours students recently made use of the same text book for a different module enhances their ability to assess the e-portfolio entries. They received training on how to assess the entries.

The lecturer required the assistance of the Faculty's blended learning coordinator for setting up the e-portfolios on the Mahara platform, basic student training, and pedagogical and technical support.

Learning and assessment activities

Educational approach

The e-portfolio assignment was based on the principles of experience based learning and integrative learning. In experience based learning knowledge is created through reflection on and transformation of experience. In order to effectively facilitate the effective integration and understanding of career related concepts with the students' personal experiences the following criteria were adhered to;

- A theoretical base was provided through lectures on the course content and the provision of examples
- The e-portfolio reflection questions required application of the theory to the students personal experiences and was thus personally meaningful
- Students were given the opportunity to reflect on and discuss their career related learning experience throughout the process of answering the reflection questions
- The assignment required an integration of the student's whole person, including reflections on their personality, strengths and weaknesses, abilities, skills and emotions
- Their experiences and reflections were assessed and feedback was provided by the assessors

Learning and assessment activities

Every second week during the lecture students were provided with a reflective question. This question is based on the module content discussed during the past two weeks. Students create e-portfolio entries

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based on these questions. They are welcome to use images, video, audio and other resources they feel may be helpful. Assessors each had a few students whose entries they had to assess according to a rubric provided beforehand by the lecturer.

Feedback practice

The rubric used to mark the assignments was uploaded to the relevant student entry. The assessors also wrote some critical feedback for the students on their entries.

Learning environment

Learning setting

Learning started in the lectures and was continued on the e-portfolio platform. The lecturers decided to make use of the SUNLearn e-portfolio site which is run on Mahara. It was chosen because it does not require students to create an extra account and the platform is very similar to SUNLearn.

Technology resources

Students made use of Mahara, the SUNLearn e-portfolio site and SUNLearn for learning.

Support challenges

Students needed more support in the technical aspects of Mahara. Sharing e-portfolio entries proved difficult. Some students also found it difficult to master the creation of an e-Portfolio.

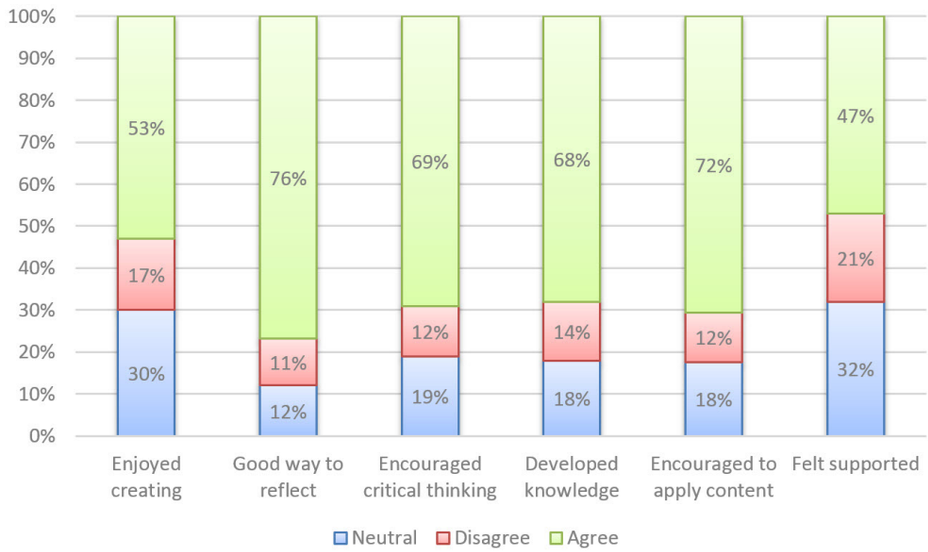
Student experience

Student feedback on learning experience

As part of their last reflection students had to complete a survey on SUNLearn regarding the feedback on the e-portfolios. Overall, the student feedback was positive. Students felt that they were granted the opportunity to apply the module content, develop their knowledge and critical thinking skills. Most students (76%) argued that it is a good way to reflect.

The qualitative feedback was also largely positive. The following student quotes give an overall reflection of the positive feedback:

- "not only have these reflections been helpful in learning the course material, but have been a life changing tool allowing me to explore my skills and abilities."
- "It wasn't just another task I had to finish, but I benefitted as well. It taught me to better write and organise my assignments."
- "The reflections were also a good point of discussion between classmates as we all did bounce off ideas from one another. This improved learning and interest through peer-to-peer interaction."
- "The reflections have taught me how to apply the work I have learned in the week in everyday situations. I often find myself sitting in a lecture wondering where will I ever use the work discussed and by doing these reflections I have managed to apply the knowledge to practical situations."



On a smaller scale, students also gave some negative feedback. They raised points that lecturers were also aware of. This included the need of more technical support and more interactive feedback from assessors.

Assessment impact

To accommodate the e-portfolio entries, the assessment weights were slightly altered. The e-portfolio assignment was both summative and formative in nature. However, the value derived from the assessment was most evident in the formative/developmental opportunity provided. The assignment provided an alternative form of learning and grade attainment

A reflective e-portfolio: enhancing theory application using Mahara

Faculty of Economic and Management Sciences | Department of Industrial Psychology

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Learning and assessment activity:
e-Portfolios

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Mahara

for students who did not fare well in the formal assessment (semester test). The assignment contributed 20% to the final class mark (predicate) and a lower number of students were disqualified from the final assessment compared to the previous year.

General

Opportunities

Encouraging students to reflect on the module content and apply it to real-life situations proved valuable to the students' learning. Class attendance also increased even when there were no reflection questions scheduled.

Challenges

Students and assessors need to understand exactly what a reflection entry is and the purposes behind it. The training session for students and assessors must be extended in the future. The assessors were also a bit unsure about the rubric and the lecturers decided that the rubric will be adapted with the assessors in the future, giving the assessors ownership and a better understanding of the rubric.

The feedback that assessors gave was sometimes a bit short. This feedback will have to satisfy minimum requirements as set up by the lecturer in the future. More feedback will also engage the students in an interactive conversation on their entries. Students will also get access to each other's e-portfolio entries and be able to comment.

The e-portfolio project came with a big administration load. In the future, the lecturer wishes to appoint an administrator to run the project.

Advice

It is vitally important to assess the affordances of the tool as well as the expected challenges as outlined above. A clear link should be made between the assignment and the learning outcomes. The required support should be identified in advance and effective communications channels set up between the students and the support staff, assessors or lecturers. Clear timelines should be communicated to assessors for feedback on the students work in order to ensure that effective experiential learning takes place.

Utilising the e-portfolio during teaching practice as a reflection strategy within a blended learning approach

Faculty of Education | Department of Curriculum Studies

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Learning and assessment activity:
e-Portfolios

Learning technology:
Google Blogger and Google Suite

Context

Background overview

The e-portfolio formed part of the Teaching and Learning 774 module (Teaching Practice) in the Postgraduate Certificate in Education (PGCE) programme. There was 195 students in the programme, but only 11 participants were identified for this experiment. These 11 students have already graduated and most of them has a fairly good competence in utilising technology.

The project was implemented when the students visited the schools in the third term during their teaching practice. The project was funded by the Teaching Development Grant, along with staff capacity development, postgraduate supervision development, tutorial support and implementation of the department's language plan.

Intended learning outcomes

The purpose of this project was to inform Stellenbosch University and the Faculty of Education of the critical enablers necessary for the sustainable and sensible implementation of e-portfolios as reflective tools for learning within the given context.

Established practice

Teaching and Learning 774 forms part of the whole PGCE programme. Students have to submit a portfolio after the school visit. Reflection forms a major part of this portfolio. For this project, students still had to comply with the criteria for the portfolio, but the e-portfolio focused on the reflection aspect.

The challenge and possible advantages associated with the integration of technology

The portfolio is an important learning strategy, but it tends to become overwhelmingly large. The e-portfolio therefore not only tried to address this issue, but was also seen as an effort to apply the blended learning approach towards learning. This project speaks to the world of the student who works with technology on a daily basis. It can enhance blended learning. It is also a more "green approach" towards learning.

Other relevant role players

Three academics were involved as mentors. The project also had a technical assistant whose availability to attend to technical matters and support, was most valuable.

Learning and assessment activities

Learning activities

As part of the e-portfolio project, Gmail accounts were created for all students. Students designed a blog and reflected regularly on their teaching practical. The students could insert photos and audio clips in their reflective entries. They could also share their blogs and interact with other students on their blog.

Assessment activities

e-Portfolio entries were made available to lecturers and mentors. These entries are then marked with the rest of their teaching practical portfolio.

Feedback practice

The lecturers and mentors hoped to communicate with the students regularly on their e-portfolio entries, but some technical problems prevented them from connecting with each other through their blogs. This will be eradicated in the future.

Student self-regulation

Students had to design and develop their blogs individually. They had the flexibility and freedom to create their blogs and there were no restrictions. They could thus pace themselves and even set their own standards. Which they did.

Learning environment

Learning took place in the authentic school context and online using the e-portfolio platform. Google Blogger and Google Suite Apps were used for this purpose.

Collaborative settings

There were no tutor groups, but students could communicate and collaborate with their fellow-students and the three staff members involved. They also had technical support from a dedicated person who

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Faculty of Education | Department of Curriculum Studies

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Learning and assessment activity:
e-Portfolios

Learning technology:
Google Blogger and Google Suite

were available to them at all times.

Support challenges

The technical support did create some challenges as everyone could not access the blogs of the other students. They would invite each other and then some technical problem would prevent them from doing so. This problem will be addressed in the future.

Student experience

Student feedback

Formal interviews were conducted with the students and the following main trends emerged:

Theme	Subtheme
Digital literacy	Mobile Literacy Skills Role of Tablet
Reflection	Student preparation in reflective practices Real time feedback from facilitators Value of reflection
Value of e-portfolio in teacher practice	Impact of peers' blogs Value for novice teacher

Students required more training since they lacked technical skills, especially in blog creation and Google Hangouts (communication tool). The ubiquitous nature of the tablet also required further enhancement of literacy skills in order for them to thoroughly understand and value the role of the tablet.

Students must be prepared to engage in reflective practices. Students were unsure in the difference between writing a journal entry as opposed to a weekly reflection. Some also found it difficult to become skilled in being a critical friend. Students asked for real-time feedback from facilitators.

Although finding it challenging to "reflect" in the true sense of the word, students did, at a conceptual level, appreciate the practice of reflection. Students find the reflection valuable. Lecturers are aware that this was a self-selected sample and it will be interesting to see if this will be positive with a different sample.

From the student feedback, it was apparent that students valued the use of e-portfolios in teacher practice. Access to peer's blogs provided ideas and challenges to try something new to the students. It also gave students an overview of different types of school contexts and an opportunity to critically assess the context they would like to work in. Despite the differences in school contexts, students were aware of the common challenges in different types of schools, which is valuable for novice teachers.

General

Opportunities

Overall, the project worked well and students reported that they have learned a lot. The following aspects will be addressed in the future:

- Training and support for students with regard to
  - Conceptualisation
  - Reflective writing
  - Creating an Online community of practice
- Assessment of digital literacy skills must receive attention as not all students have the same level of skills and knowledge.
- Mobile learning digital skills - an integrated approach in teacher education is appropriate.

iUS: The University-School iPad Project

Faculty of Education | Department of Curriculum Studies

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Learning and assessment activity:
Flipped classrooms

Learning technology:
iPads

Context

Background Overview

The Department of Curriculum Studies have approximately 1 000 B Ed undergraduate students in Reception, Foundation, Intermediate and Senior phases, as well, as post-graduate students. This project covered the English Teaching and Learning, Science, Mathematics in the Department of Curriculum Studies. It covers the methods and approaches in language and literacy instruction.
After successful completion of the module students understand a variety of different approaches to the use and integration of technology in the teaching of language and literacy, science and mathematics at foundation and intermediate phase level.

Student overview

There are approximately 200 B Ed foundation and intermediate phase students enrolled in the English Methodology course. Most of them come from Afrikaans or English language backgrounds. Since the lecturer teaches them from their third year onwards, they have all passed English second year. Most of them have access to personal computers, either at home or at the University. For the iPad project, a group of approximately 25-30 intermediate phase students will participate in the iPad project.
There are 89 and 79 students in the 3rd and 4th year Mathematics Education cohorts respectively. iPads will be used for group work in lectures and class work in both cohorts. Ten 4th year students will also use iPads to develop multimedia learning material for the fostering of mathematical thinking of Foundation Phase children.

Established practice

Students are taught the theory of reading and writing with different approaches and methods in English first language and English Additional Language. Mathematics are learned by understanding through a problem-centered approach by connecting theory and practice. Natural Science education is learned with a focus on physics and chemistry.

The challenge and possible advantages associated with the integration of technology

The challenge is to answer the question: what does twenty first century learning look like? By using iPads for teaching and learning, students are engaged in a flexible and personalised approach to learning. This device allows students to express their creativity more productively and provides opportunities for seamless interdisciplinary learning. As students move between subjects and different venues iPads remain with them enabling them to store and reuse work in different contexts. It enables self-directed learning, open collaboration and cooperation between students.

Learning and assessment activities

Learning activities

Students used Apple TV and the sharing function of the iPad to 'show and tell' their work and demonstrations. Groups can give critique and create a community of learning in the classroom. The use of iPads also develop multimedia learning material for the fostering of mathematical thinking of Foundation Phase children, specifically mathematic storybooks. The flipped classroom model is followed in the learning activities.

Assessment activities

Surveys were completed in response to the Substitution, Augmentation, Modification and Redefinition (SAMR) model. This model offers a method of seeing how computer technology might impact teaching and learning. The Unified Theory of Acceptance and Use of Technology (UTAUT) framework was used to analyse data generated through interviews with the fourth year students involved in developing learning material (Venkatesh, Morris, Davis & Davis 2003).

iUS: The University-School iPad Project

Faculty of Education | Department of Curriculum Studies

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Learning and assessment activity:
Flipped classrooms

Learning technology:
iPads

Learning environment

Learning took place in and outside of lectures. iPads, Apple TV, different apps and the internet was used as learning took place.

Support challenges

It would be ideal for each student to have personal access to a tablet for the duration of the iPad course instead of having to share iPad among student groups and across different subjects. From an infrastructure side, the strength of the WiFi and lack of internet access is challenging.

Student experience

Student feedback was collected through a survey, focus group discussions and responses to the SAMR model.

General

In the future, the iPad project will be expanded in the Faculty and to project schools. Short courses will be developed for educators using mobile technologies in education. Students and staff will need training on the use of iPads and on available apps for different uses.

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Monitoring student progress in a Clinical Communications module

Faculty of Medicine and Health Sciences | Department of Speech, Language and Hearing

Clinical Communications Team & Language Centre
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Learning and activity:
Track student progress

Learning technology:
SUNLearn

Context

Background overview

The Clinical Communications module in the Department of Medicine and Health Sciences engages students in both Isixhosa and Afrikaans. Students include second year Occupational Therapy students, second, third and fourth year Speech, Language and Hearing Therapy students and second and third year Human Nutrition students.

Established practice

Students attend one class per week and the majority of the learning is done via SUNLearn by making use of SCORM packages. For students to be able to participate in the e-assessment phase of the module, the student has to complete all the SCORM lessons. Students work through the online content at their own pace, over a set time, to get access to the e-assessment, called e-Tasks.

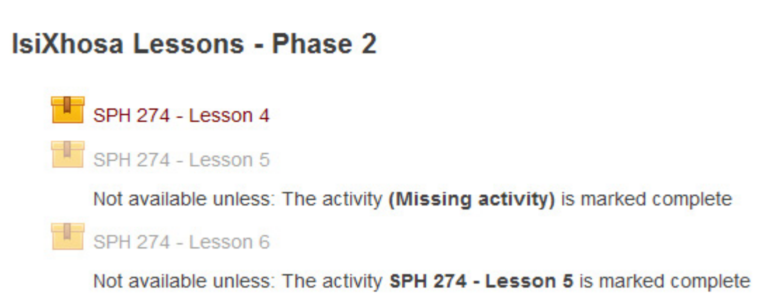
The challenge

The challenge faced by the facilitators was that the tracking of students' progress was done manually, which in turn impacted negatively on the amount of time the facilitators had to spend with students. To address this challenge, a module was created, using the learning management system (LMS), which incorporates automated tracking via the SCORM and LMS systems.

Learning and assessment activities

Assessment activities

SUNLearn offers its facilitators the ability to track a student's progress through a module, while controlling a student's access. This can be tracked and monitored by the Activity Completion setting within the module. Activity reports can now be generated via the LMS and the SCORM Module.



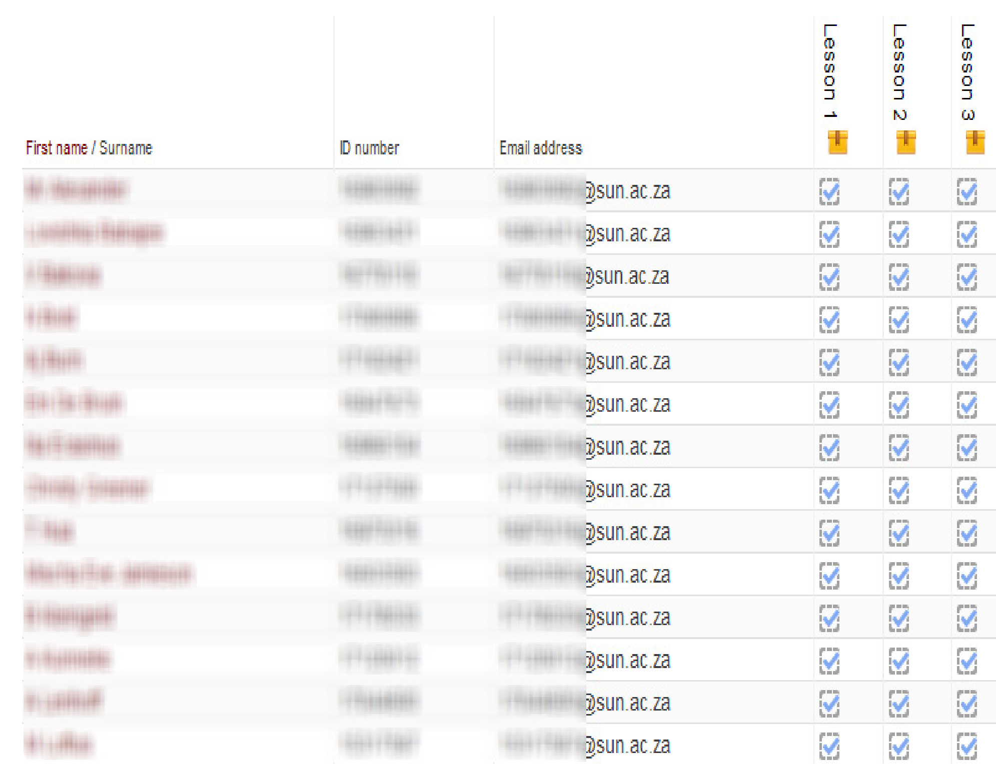
The check boxes on the right hand side are used to track an individual's journey through the course. In this case, the check box is automatically ticked when the SCORM activity has been completed. This has been done by using the Activity Completion setting, set to "show as complete" when the activity has been fully completed.

The second part of the instruction was to make sure that the students completed the module in a sequential order. This was achieved by using the Restrict Access function, which can be the found in the edit settings link for the activity.

To summarize, activities were restricted until the preceding activities were completed.

By having the system track each student, the facilitators were less occupied with the administration of tracking student activities, which allowed for:

- More time to work on and improve the SCORM activities;
- More time for one-on-one student sessions.



Monitoring student progress in a Clinical Communications module

Faculty of Medicine and Health Sciences | Department of Speech, Language and Hearing

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Clinical Communications Team & Language Centre
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Learning and activity:
Track student progress

Learning technology:
SUNLearn

General

Challenges and opportunities

Some students appeared to be struggling with obtaining the Activity Completion tick. This was initially presumed to be a system fault (either SUNLearn or Articulate), but it was found to be that the way students navigated through the activities and missed key navigational markers.

This trend showed a steady decline towards the end of 2014.

Since some students appear to ignore written instructions regarding navigation, they should receive a training session on navigating through the SCORM activity and the LMS.

Since the initial outcome was achieved, no other recommendations are required at this stage.

Implementing a BYOD project

Faculty of Medicine and Health Sciences

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Learning and assessment activity:
BYOD project

Learning technology:
Students' own devices

Context

Background overview

BYOD (Bring Your Own Device) is defined by Gartner (2013) as "an alternative strategy allowing employees and other users to utilize a personally selected and purchased client device to execute enterprise applications and access data. Typically, it spans smartphones and tablets, but the strategy may also be used for PCs." Although BYOD has been internationally employed since 2009, the faculty's use of BYOD within the e-Learning environment – currently for exams and tests – is unique to the African continent, and therefore lacks a reference point or model to work from, either within the university or within the African context.

The challenge

The BYOD project was necessitated by the high use of electronic assessments within the faculty, resulting in the demand for Faculty of Medicine and Health Computer Usage Area, also known as GERGA, limited facilities growing exponentially. Large groups of students (300+) needing to complete exams and assessments, have to be split into multiple groups and sessions and kept isolated from each other during exam periods. Furthermore GERGA has to be closed for general use during these periods, disadvantaging the rest of the student body.

Student overview

Surveys done by GERGA in 2013 gave clear indications that over 80% of the total student body at Tygerberg possessed their own devices, that could be used for BYOD, and of those, more than 70% were strongly in favor of adopting BYOD for electronic assessments. Dr Altern Du Plessis from the Centre for Institutional Research surveyed the first year 2014 student intake and found that 83% of all university first Year students owned BYOD-capable devices, and that 94% felt that using computers was very beneficial to their studies.

Learning and assessment activities

The pilot project

BYOD, as an alternative strategy to address the capacity issues of the limited GERGA facilities at Tygerberg Campus, was proposed in late 2012, and introduced as a pilot project in early 2014 under the guidance and direction of ELITAC (E-Learning and Information Technology Advisory Committee).

Since January 2014 all GERGA computers were converted to "thin clients" to introduce students to the concept of working on virtual desktops. The term "thin clients" refers to inexpensive, barebones computer setup that serves as a user interface device in a client-service architecture.

The Tygerberg BYOD system for electronic exams allows 500+ students to use their own devices (tablets or laptops) to connect to a VDI (Virtual Desktop Infrastructure) desktop via a high-speed secure wireless network, and to be connected to a standard and secured environment to complete their exams. (This environment is more secure and stable than the old fixed desktop environment on the GERGA computers and is entirely customizable.)

Results of the pilot project

Students wishing to use BYOD for exams are required to "register" their devices on the network. (This process takes less than 15 minutes and only needs to be done once.) Between 30 and 80 students used their own devices per exam. Students using the BYOD system, complete their exams in an environment identical and concurrently to those of GERGA computers, thereby reducing the need for multiple sessions for one exam using GERGA alone.

Implementing a BYOD project

Faculty of Medicine and Health Sciences

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A temporary contract post for a BYOD Liaison officer was created in June 2014. This position works with the three role players in BYOD: Departments, Students and the Exam Office. This post's primary task is to manage the adoption of BYOD at the Faculty, assist students in the setup and use of their devices in BYOD, and scheduling and allocating students into BYOD and non-BYOD groups for exams.

The BYOD system (Virtual Desktops/Secure WiFi) is currently capable of accommodating electronic exams, as well as giving students normal GERGA access with full services via their devices, as well as also making learning materials (podcasts, class notes) accessible to their device, reducing the need for physical seating in GERGA, as well as reducing the need for printing of notes.

After the pilot project

GERGA is confident that BYOD has proved itself during the pilot study to be an acceptable and cost-effective method of doing electronic exams and assessments, that the system exceeds the current standards of security and stability within the university for electronic exams, and addresses the capacity challenges of GERGA to accommodate the growing number electronic exams and increased intake of undergraduate students.

All new students in the 2015 intake was informed that the Faculty expects that they acquire a BYOD-capable device (minimum specification list as well as some suitable makes/models is available) before they commence their studies in February 2015. It was also communicated to the potential student that failure to have a BYOD-capable device will not preclude them from being accepted to study at Tygerberg.

All undergraduate students should indicate their "BYOD status" (do they own a BYOD device and can use it for BYOD exams) during their e-registration (online) at the beginning of each year. This demographic data should be included in the e-registration process and should not be regarded as a general survey, where strict compliance is not required. This data will be used to allocate students to the appropriate groups for completing electronic exams in a non-BYOD area (GERGA) and a BYOD area (5th Floor Exam room). Students would be required to declare changes in their BYOD status during the year to allow reallocation to the appropriate exam group.

General

Challenges

Departments and students are generally reluctant or sceptical about adopting BYOD as an alternative strategy at Tygerberg Campus. Factors that influence adoption are:

- Ignorance of the security of the BYOD system.
- Concerns that students would be penalized should something go wrong with their device during a BYOD exam.
- Perceived additional workload on the personnel in departments to allocate and manage both BYOD and GERGA groups.
- Uncomfortable working conditions in the exam room.

Conclusion

The BYOD Strategy dovetails fully into the ICT strategy of the Faculty of Medicine and Health Sciences and overarching ICT strategy of the Stellenbosch University, and is regarded as an integral part of the Faculty's e-Learning strategy. BYOD is not a temporary fad but an established and growing strategy that will ensure that the culture of continuous learning within the student body.

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‘Blending’ a Postgraduate Diploma in Addiction Care

Faculty of Medicine and Health Sciences | Department of Psychiatry

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Context

Background overview

The Postgraduate Diploma in Addiction Care aims to enrich, broaden and consolidate the knowledge and expertise of professionals working within the field of addiction care, by providing them with a review of the current evidence base relevant to this field. The purpose is to improve the candidate’s care for patients with substance use disorders, rather than to provide basic knowledge or research capacity.

The curriculum covers the most important areas within the field of addiction care and help mould well-rounded addiction-care practitioners. The intended outcomes of the programme include a comprehensive knowledge of the theory relevant to the field of addiction, as well as holistic skills to provide effective, evidence-based interventions to patients with substance use disorders. Candidates also learn about appropriate professional and ethical practices.

Student overview

For admission to this Postgraduate Diploma in Addiction Care, a candidate must hold a bachelor’s degree and appropriate professional registration in a field relevant to health or social welfare, e.g. social work, medicine, nursing, psychology (a four-year bachelor’s degree, such as a BPsych, or alternatively a three-year bachelor’s degree and a one-year honours degree, such as a BA in Psychology followed up by a BAHons) or occupational therapy. A nursing diploma in conjunction with an Advanced Diploma in Psychiatric Nursing Science is also be deemed equivalent to a four-year nursing degree and hence meet the admission criteria. At least two years’ professional experience is an advantage. Students are fluent in written and spoken English. They also must have access to the internet and be computer literate. Students are also required to use mobile and/or recording devices for participation in certain course activities.

For 2015, there are 23 registered students; three male students and 20 female students. There are 10 new students for 2015 (i.e., 10 students that registered for the first time with this program). The students come from a variety of disciplines; including, but not limited to social work, occupational therapy, psychiatric nurse, psychiatrist, general and counseling.

The challenge

Substance addiction is a significant public health problem in the Western Cape. To address the skills deficit in the treatment of substance abuse, the Department of Psychiatry has developed this postgraduate diploma in addiction care. The challenge is that many students struggle to get time off work to attend classes. They often live far and find it difficult to frequently travel to attend lectures. Therefore, this Diploma is presented in a blended learning experience, including both e-learning and experiential learning with e-supervision and limited face-to-face contact time.

There is a course outline for each module that is divided into themes that are divided into weeks. There are recorded podcasts for each theme as well as directed self-reading (articles, for which the URL link to the library is provided). Because of the difficulties in accessing bandwidth, the podcasts are also available on CD if the student prefers this. Some themes also have class notes.

Each theme have a form of evaluation, which can either be quiz on the coursework that tests knowledge, or an assignment that test application of knowledge. Assignments are also submitted online via SUNLearn. Students need to complete a log book of practical work. There is a supervision chat once a month, for two hours on a Friday, which is compulsory for students to take part in, where they are provided with supervision for the practical work. The plan is to increase this to 2 weekly sessions next year, as students find this a valuable learning opportunity. There is also a tutorial chat for one of the modules. Students are encouraged to make regular use of the discussion forums on SUNLearn. Students can bring any comments, queries, issues or problems with regards to the academic work to this forum. They can also comment on the opinions of your colleagues. All of these activities count towards their class mark. A Facebook page for students and alumni has been created in an attempt to improve the group cohesion.

There was a contact week from 26-30 January. It was mostly for Year 1 students, but Year 2 students also attended the session in the e-classroom, in order to be orientated with regards to accessing the online learning material. During this week, students also visited the library and had training from the library staff on how to use the virtual library. During 25-29 May,

‘Blending’ a Postgraduate Diploma in Addiction Care

Faculty of Medicine and Health Sciences | Department of Psychiatry

Programme Coordinator: Dr Lize Weich lizew@sun.ac.za
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Year 1 students had their second contact week and also wrote examinations for their first two modules. Year 1’s will have a final contact day in October to write their final examination. Year 2 students have a contact week in September and write their examinations during three days in October. There is also a monthly addictions academic CPD meeting, but attendance is optional. The contact sessions have been grouped into contact weeks as opposed to short sessions throughout the year, allowing students who live far to attend, thereby improving the reach of the program. The contact sessions focus on application of theory and practicing of skills (e.g. tough group discussions, role plays etc.), as opposed to parting of academic knowledge, which is mainly done online.

Other relevant role players

The curriculum was developed by the module lecturer and coordinator. Psychologist colleagues helped with lecturing during the year 1 contact weeks, where the focus is on learning therapeutic skills. Guests, who are experts in specific areas, were invited to comment on the material for specific themes and make podcasts.

The Blended Learning Advisors, coordinators and IT- support provided the technical support for podcasts- they provided advice and suggestions and loaded Camtasia onto the relevant laptop to record the podcasts and then converted the files into usable podcasts and wrote DVD’s for our students. This project would not have been possible without their support.

An MPhil student is helping with supervision chats and the coordinator’s colleagues help with the contact weeks. An admin person was also appointed and he is responsible for the day to day running of the course.

Learning and assessment activities

Educational approach

The programme developer thought about what knowledge, skills and attitudes workers in the field need and used that to decide on the curriculum. She felt students would procrastinate if they did not have clear tasks set out for each week, with frequent checks to ensure that they were staying on top of the work. It was important to ensure they get enough support when applying the new concepts into their day-to-day practice.

Learning activities

Currently, we have 10 modules (1 of them optional), but from 2016, the diploma has been simplified so that there will be 3 year 1 modules and 2 year 2 modules, i.e. 5 modules in total. The course is offered in a blended learning mode and includes guided self-study, assignments, homework tasks and experiential learning where students will be expected to log practical hours. Students must also attend formal lecture weeks.

Assessment activities

Students are expected to show satisfactory attendance of classes and satisfactory participation in e-learning activities and to obtain a class mark of at least 45% for each module to be eligible to write the examinations for that module. Quizzes, assignments, supervision chats, forums make up their class/ predicate mark. Those that qualify will then write examinations. Students are expected to obtain a subminimum of 45% examination mark and a minimum of 50% as a final mark to pass the module. The class mark will be made up of continuous evaluation and assignments. The final mark for each module will be made up of both the examination mark and the class mark. Students pass each module if they have a final mark of at least 50%. To qualify for re-examination in a module, a student must have obtained in such module a final mark of not less than 45%.

The final mark for the programme shall be calculated as the weighted average of the marks for the completed modules. Students will be expected to submit a logbook with the required satisfactory participation in practical work placement for a specified amount of hours before they will be allowed to graduate.

Feedback practice

Students receive feedback via SUNLearn and email, but could also make an appointment to meet with lecturers and assistants in person to discuss feedback on their activities. The quizzes give the student the correct answer to a question if they get it wrong, so that they can learn from their mistake and sometimes, comments are also included as feedback. Students who fail a quiz, are invited to re-do the same quiz. A marking rubric is used to grade assignments, to help a student identify the areas that they can improve in. Students also get detailed personalized feedback for assignments (sometimes using voice feedback, other times written feedback). Where relevant, general

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feedback about an assignment is given to the whole class via the discussion forum.

Learning Environment

Learning setting

SUNLearn and the various activities that it has to offer were used. Google Hangouts, Skype and similar programs for group supervision were considered, but most students are more mature and feel threated by too much technology and it was decided against.

Content resources

Students receive a handout at the start of the year and also have a training session in the e-classroom and at the library during first contact week. Each module includes a module outline with the themes and all the reading, podcasts etc. This is available online via SUNLearn and the podcast website. The SUNLearn page has a link to the library and the podcast website.

Student Experience

Student feedback on the learning experience

Blended Learning were only implemented in the course in 2015. Therefore, only year 2 students could give feedback on how the course has changed.

Some feedback from Year 2 students:
Students felt blended learning is definitely a better option as it reduced cost and time spent on travel for students not able to take leave from work. They were also able to access the material at any time and from any place. Some students seemed to struggle with the rate/speed that real-time online chats take place at. It could be beneficial to limit the group size when engaging in certain activities (like online chats). Students valued the fact that there was a strong online presence and prompt replies to comments and enquiries. Some advantages of making use of podcasts include the fact that students can work through them at their own pace and students can also access the podcasts wherever they are. Some students commented that some of the material is not suited for communication via podcasts, and requires face-to-face tuition. Similarly, there is a Year 2 student that believes class-based lessons are a better way to encourage critical thinking at a post graduate level.

Feedback from Year 1 students:
Students commented that they were forced to improve their computer skills and felt this was a bonus for them. Some struggled with the Eskom power cuts and problems with connectivity. Almost all commented that they enjoy the online chats and gain a lot of insight from them. This way of teaching allows students to schedule their own class and homework times around an already busy work and family life; and allows them to save on leave days from work. Another added benefit is that it is also less of a financial burden, as students don’t have to travel often. A recommendation is to set up some type of meet and greet or team building exercise for fellow students. This will help build good relationships and will allow students to support each other throughout the year. There was also a suggestion for 1 or 2 more contact weeks.

Also, just a direct quote from one of our Year 1 students: “I take my hat off to the brilliant mind behind the PG Dip online learning program and the way in which it has been set up”.

General

Opportunities and Challenges

The implementation of blended learning have given the program a wider reach: the programme is now much more accessible to a variety of interested people, (many of the students are also full time employed and some have to come from far away, there has even been interest from other African Countries). This means that if a student work diligently throughout the year, there is no need to take extra leave days from work (except for contact weeks and examinations).

Blended learning takes an immense amount of time and work to develop the material. The benefit is that once it’s done, it does cut down on actual hours spent lecturing. If you want the program to be successful however, it requires that you invest the time saved from lecturing, into online activities. The lecturers have found that we have lost some group cohesion in the class – will invest more time next year during the first week on team building.
It was hoped that the forum will replace class discussion and debate around topics, but students are reluctant to use this medium and need a lot of prompting. The supervision chats have been really effective.

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Advice

The lecturers, assistants, coordinators and support have the following advice for colleagues:

- Select reading carefully so that it is not too much, is interesting and relevant – e.g. review articles rather than papers on clinical trials. There is also a host of material already online- like YouTube videos, websites from professional organizations etc. that students can explore.
- Structure the students’ calendar and build in checks, otherwise they will only procrastinate.
- Create enough opportunities for class interaction and discussion.
- With regards to supervision chats: Students send in summaries of the problems they encounter in their practical placements, and we send out case vignettes for the tutorials, which we circulate before the chat and then discuss in the supervision chats. Case summaries are sent out beforehand and numbered so that students can think about them. This is then discussed one by one. It is usually clear which case are discussed to everyone, but students are encouraged to comment with the number of the case they are referring to, so that there is no confusion. Students find the chats very helpful.

Using podcasts to teach Dermatological education

Faculty of Medicine and Health Sciences | Division of Dermatology

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Learning and assessment activity:
Flipped classroom

Learning technology:
Podcasts

Context

There were over 200 students enrolled for the The Skin 471 module in 2014. Dermatological education students have two weeks of formal lectures and two weeks clinical rotation. The two weeks of lectures adds up to 40 lectures that are divided between lecturers. These lectures followed structured themes according to the textbook.

The challenge

The lecturer received great feedback in the past, but wanted to change the module. The lecturer questioned if traditional lectures was the best way to teach students. It does not encourage self-directed learning and can be labour and time intensive for the lecturers. Many students also did not attend the lectures.

Learning and assessment activities

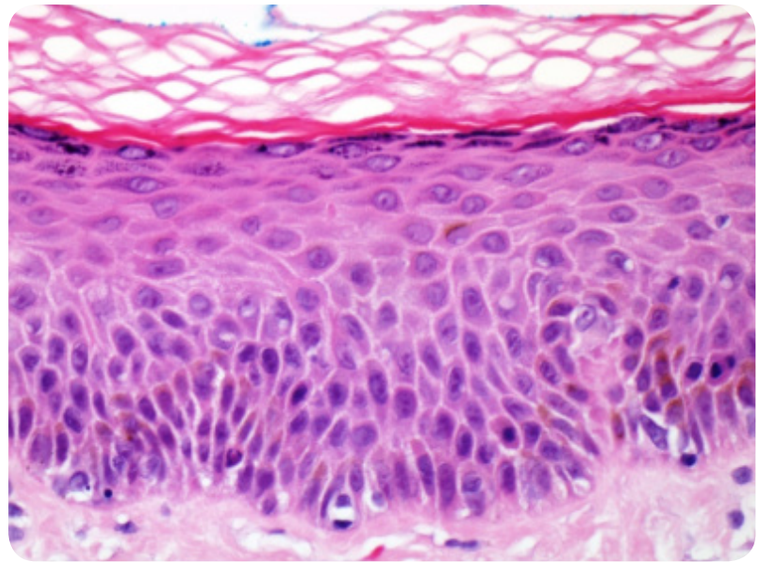
Educational approach

The lecturer drew motivation by recent studies of McCleskey (2013) and Jenkins, Goel and Morrell (2008) and worked towards adapting this module to a more blended learning approach.

Learning activities

The lecturer made a few focused changes. All previous lectures were podcasted and contact sessions were reduced to two days. During the first week students had an opportunity to work through all the podcast lectures in their own time. The language used in the podcast was a mixture of Afrikaans and English. If students were English speaking they would pair up with an Afrikaans student to make sure that they understood everything. While working through the lectures students were required to make lists of conditions that may be present with various symptoms. Students still had the textbook and study guide available to guide their learning experiences. The study guide contained a timeline or program for students to plan their time appropriately.

The plan was to let students build up a basic knowledge with the podcasts and then integrate this knowledge with practice during the contact sessions.



Student experience

Student feedback

Students reacted positively towards this new teaching approach. They felt that having the podcasts available allowed them to take responsibility for their own learning. Students felt that the module was well organised and they know exactly what was expected of them. Some students did experience difficulty in downloading the podcasts.

General

Advice

For lecturers that wish to implement a similar teaching approach in the future, the lecturer has the following advice:

- The language in which the podcasts are recorded is very important.
- Technical aspects will arise and must be addressed effectively.
- Podcasts should be adequate to convey a message.
- Contact sessions are still important for deep learning.
- If this approach is followed, the lecturer must have an "open door" via e-mail for questions.

Using podcasts to teach Dermatological education

Faculty of Medicine and Health Sciences | Division of Dermatology

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Podcasts

Conclusion

Teaching and assessment techniques should constantly be re-evaluated to ensure optimal teaching and learning. Lecturers must rethink the use of PowerPoint lectures and use the available technology to enhance their teaching and assessment. This can also be done by combining different teaching and assessment methods.

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Flipped Streamed Tutorials in the Department of Nursing

Faculty of Medicine and Health Sciences | Department of Nursing

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Learning and assessment activity:
Virtual classrooms

Learning technology:
Microsoft Lync

Context

Background overview

Using streaming to host virtual classrooms is fast becoming a reality at many universities and Stellenbosch University is not excluded. Currently there are trials occurring in various university departments that uses Google Hangouts and Hangouts-on-Air to test streaming capabilities' potential.

At the Faculty of Medicine and Health Sciences, the SURMEPI e-Learning team has been requested to setup a number of webinars for small groups of people using Microsoft Lync. They have also been giving training on how to use Microsoft Lync to the Faculty's staff during lunch time sessions.

The challenge and possible advantages

Due to budgetary constraints, the Department of Nursing approached the Faculty's e-learning team to provide alternatives to normal satellite streaming through Telematics at the Centre of Learning Technologies. The purpose of this streaming exercise is for additional classes (tutorials) to be had, using an online platform, but also allow for real-time interactions between the student and lecturers, whether it be by IM (instant messaging) or verbal interactions. This platform would have to be able to handle up to 200 active connections.

Learning environment

The options

The alternatives presented to the Nursing Department included the use of:

- **Google Hangouts** (including Hangouts-on-Air)
  Google Hangouts allows for live video streaming for 15 active participants, while the rest would watch the feed via YouTube with a 30 second delay.

- **Microsoft Lync**
  Lync allows for live video streaming online with a larger capacity of active users (150 active users). This capacity can also be increased as needed (with prior notice). It also for users to dial into the conversation should they experience any problems.

- **Telematics**
  This option was discussed with the Nursing Department as everything is already in place to do these broadcasts. Due to budgetary constraints, this was deemed as not being an option.

- **Adobe Connect** was not considered due to the high costs involved.

Setting up

Since the expected attendance was around 200 participants and Telematics was not an option, it was decided to go with either of the other 2 options. Some research was done into how this streaming project could be done while at the same time allowing online participants to enjoy the virtual classroom experience. Another point for consideration was that the query was made with a rather short notice period, especially when considering the expected participant capacity.

Google Hangouts

The method suggested was as follows:

- Create a Google Hangout-on-Air.
- Send the links to both the Hangout and YouTube to all the participants.
- Allow up to 13 active participants to join the Hangout at any one time.
- All participants not active will follow the discussions on YouTube with a 30 second delay.
- The lecturer must always be mindful of this delay when asking questions.
- All non-active users wanting to ask questions could use either the Hangouts IM or Q&A facilities or call in via Hangouts and wait for the call to be accepted.

Microsoft Lync

- Create an online meeting request via Microsoft Outlook (you need to be an active Lync / Skype user to do this). This link can be scheduled for an extended period (over the duration of the module) to facilitate other sessions with the same group.
- Send the link created to all users and include the necessary login information:
  - the link (include the dial-in number)

Flipped Streamed Tutorials in the Department of Nursing

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Learning and assessment activity:
Virtual classrooms

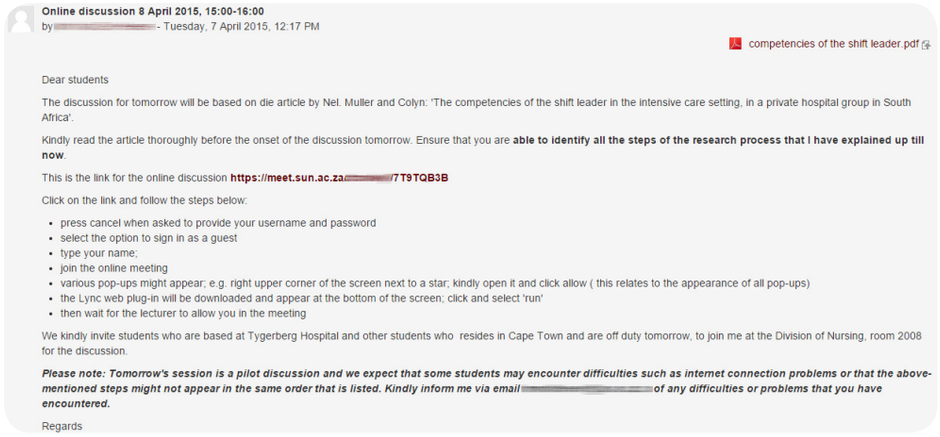
Learning technology:
Microsoft Lync

- instructions on how to access the meeting
- instructions for online meeting etiquette (mute sound when entering the meeting)
- instructions for interactions between the lecturer and class

After careful consideration, especially considering the fact that the majority of the participants are not fully computer literate, it was decided to do the trial using Microsoft Lync because of the reasons:

- It has an easy to use user-interface.
- The lecturer was already a user.
- Participants did not require Lync accounts.
- Supports larger participant capacities.
- Technical support available at the Faculty.
- IT available should further technical support (increased capacity) be needed.

A test meeting was done in order to familiarize the lecturers with the program and to identify any problems that might occur during the actual meeting. Based on this test, the lecturer sent out login instructions to the participants via the SUNLearn News Forum.



Online discussion 8 April 2015, 15:00-16:00
by [redacted] - Tuesday, 7 April 2015, 12:17 PM

competencies of the shift leader.pdf

Dear students

The discussion for tomorrow will be based on die article by Nel. Muller and Colyn: 'The competencies of the shift leader in the intensive care setting, in a private hospital group in South Africa'.

Kindly read the article thoroughly before the onset of the discussion tomorrow. Ensure that you are **able to identify all the steps of the research process that I have explained up till now**.

This is the link for the online discussion **https://meet.sun.ac.za[redacted]/7T9TQB3B**

Click on the link and follow the steps below:

- press cancel when asked to provide your username and password
- select the option to sign in as a guest
- type your name;
- join the online meeting
- various pop-ups might appear; e.g. right upper corner of the screen next to a star; kindly open it and click allow (this relates to the appearance of all pop-ups)
- the Lync web plug-in will be downloaded and appear at the bottom of the screen; click and select 'run'
- then wait for the lecturer to allow you in the meeting

We kindly invite students who are based at Tygerberg Hospital and other students who resides in Cape Town and are off duty tomorrow, to join me at the Division of Nursing, room 2008 for the discussion.

Please note: Tomorrow's session is a pilot discussion and we expect that some students may encounter difficulties such as internet connection problems or that the above-mentioned steps might not appear in the same order that is listed. Kindly inform me via email [redacted] of any difficulties or problems that you have encountered.

Regards

General

Challenges

Problems experienced by the participants (as reported by the lecturer, Marianna van der Heever):

- Not all students were admitted.
- Poor internet connectivity.
- Most students complained about sound as they were unable to hear the discussion.
- Person conducting the discussion can answer questions relating to the topic under discussion but cannot attend to technical issues such as sound or poor internet connectivity – extra person required for that.
- The headset would only solve some of the problems related to sound since with the headset on the lecturer would not be able to take questions from the students in the room.
- Students in the room should be accommodated with a microphone and students who join in through the link should be able to hear the questions or issues that those in the room ask.

With regards to the report by the lecturer;

- All students were admitted, but with no audio coming into the meeting.
- Meeting was open to all who received the link.
- Some of the participants' devices were not correctly setup for sound or their sound was not enabled (Wielligh assisted participants with this via the IM function).

These problems were noticed by the technical team monitoring the session remotely and prompted an investigation into the poor connection and sound quality that was experienced. The following was discovered to be possible reasons for the challenges experienced above:

- Poor internet connectivity on the user end caused problems. An internet connection at 3G speed (or higher) would suffice – this was tested using a cellphone as the session was in progress.
- The investigation highlighted 2 incidents that impacted that connectivity:
  - The presenter and the presenting assistant both signed into the session using the same Lync login details. This caused a conflict at times.
  - Although the laptop used to present from, was plugged into the network, the device WiFi (default connection) was left on. Considering that the session occurred in an area where the WiFi signal is known to be unstable, this was to be expected.
- External audio devices are required for the participants to communicate with each other and the lecturers.

Flipped Streamed Tutorials in the Department of Nursing

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Learning and assessment activity:
Virtual classrooms

Learning technology:
Microsoft Lync

- The presenter should deal with session and focus on the content of the session, while another person should be dealing with questions from the participants as well as recording the session.

Advice

Advice for presenters:

- Each presenter and assistants to have individual Lync profiles.
- Host computers should be connected to the network via LAN cables and not WiFi.
- Host computers to deactivate their WiFi for the duration of the session.
- External audio devices, such as a headset, is a requirement (headset or conference calling microphone).
- Use the PowerPoint sharing options on Lync.

Advice for participants:

- External audio devices, such as a headset or a cellphone earpiece, is a basic requirement.
- Another basic requirement is the internet speed should be 3G or higher.
- Students must also be aware of the fact that when entering the online session, their microphones are on and the need to keep it muted until they want to speak. Unless otherwise specified, students will enter the session as being muted. If they want to make a comment or ask a question, they can unmute themselves by clicking on the microphone icon.
- Students should also use the IM and/or Q&A functionalities to pose questions while the lecturer speaks.

General advice:

- A test call, with all the online students, should be scheduled at least 1 day ahead of the class.
- A chat activity on SUNLearn could be used to help students with issues during the test call.
- Students should receive a short training session on how to participate during their course induction at the start of the year.

YouTube videos for teaching and learning in Chemistry

Faculty of Sciences | Department of Chemistry and Polymer Science

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Learning and assessment activity:
Flipped classroom

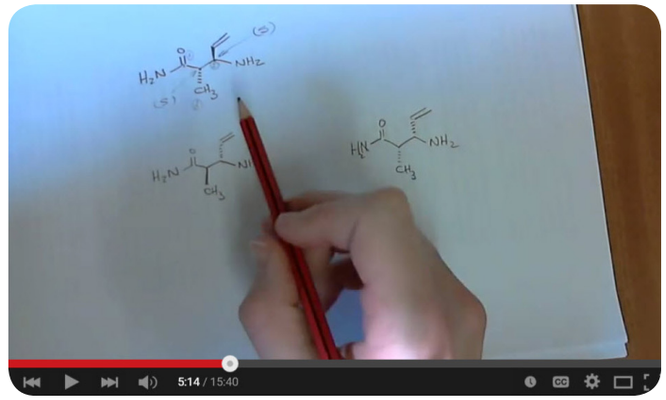
Learning technology:
YouTube videos

Context

The idea for using YouTube as a means for delivering lectures and communicating with the students was born from a number of issues the lecturer has been considering. In 2012 Gareth Arnott was toying with the idea of using a video introduction for the (then) Chemistry 154 course which he was convening. This course had just over 900 students split into five classes, so a welcoming message to the class using a video would enable the lecturer to introduce himself to the whole class on a more personal note.

At the same time, the lecturer came to the realisation that lectures tended to be a lot of information 'pushing' without the students engaging in problems; some students were quick on the uptake, but many would be clueless no matter how well you thought you had explained something. The lecturer wanted to provide a 'weekly wrap-up' in video format such that students would have the opportunity to revisit the key concepts at a time convenient to them. Those that struggled would be able to replay the lecture or stop at a point if they didn't understand.

The choice to use YouTube was carefully weighed up. Placing the videos on WebCT (this was before SUNLearn) was one option, but considering that students outside of the university network would be hit with hefty bandwidth issues since videos were recorded in HD by default. YouTube on the other hand has options to watch videos in different resolutions, partially mitigating the bandwidth problem. YouTube also has fairly nice built-in analytical tools for monitoring numbers of views over time. Ultimately the concern over bandwidth needed for YouTube was never realised as students never complained about this. IT also made YouTube free on campus to staff and students, which has helped a lot.



Learning and assessment activities

In 2012, Gareth Arnott was also teaching the third year organic chemistry course (Chemistry 344), where a weekly test system was implemented the year before. The concern was that placing the memo for the test online was not the most helpful for the students, whilst if the lecturer could 'show' them where they were making the biggest mistakes, their learning processes might improve. Doing this in class was prohibitive from a time perspective therefore YouTube was also used for this purpose. Straight after the class, the lecturer would mark the test and then immediately film the memo whilst the mistakes the students had made were fresh in his mind (screenshot of test memo video). The feedback that was received on these memorandum videos was very positive.

In 2013 and 2014, the YouTube platform was used for a 'flipped' classroom approach, putting pre-lectures online for the Chemistry 344 course. In principle the lectures could be used every year, but in practice some videos had to be redone as slight changes in the course and lectures had occurred. In 2014 the lecturer's YouTube channel was consolidated and neatened since it has become a hodgepodge of videos (link to YouTube

YouTube videos for teaching and learning in Chemistry

Faculty of Sciences | Department of Chemistry and Polymer Science

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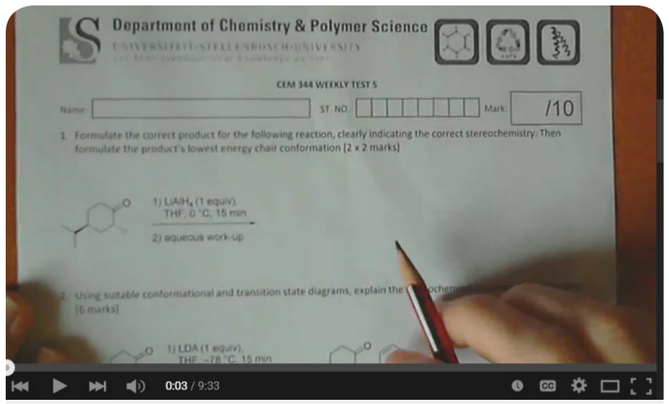
Learning and assessment activity:
Flipped classroom

Learning technology:
YouTube videos

channel: https://www.youtube.com/user/chemistryonefivefour/featured.



Initially, videos were only made available via links in the previous learning management system, WebCT, but then the videos were made available for general viewing when the honours class wished to have access to the lectures from the previous year. Every course has its own playlist, based on year. The videos were also edited to make them a little more professional. Opening the channel to the world has started to see people from other countries viewing the videos and posting some comments. In 2014, nearly a third (31.8%) of the channel's views was from countries outside of South Africa.

The channel does not only contain lectures, since the purpose was to be able to communicate with the class. One of the most viewed videos is one made for the 2013 third year class after their final weekly test. It was meant to be a fun response to encourage them. This video received over 1 700 views later, it is the most watched video on the channel.

Student experience

The videos is first and foremost a tool to complement the course content. It has been working for this lecturer, and the students have been generally positive, but it may not work for everyone. However, from the student feedback there has been a couple of negative feedback comments from the third year class, that the videos took too much of their time. The lecturer suspects that this was because of the flipped classroom approach, but since each lecture was on average 11 minutes long (for 12 videos), the criticism was probably from weaker students who were struggling to keep up with the material and the rest of their course.

The following opportunities and challenges can be identified, from the lecturer's 30 months of experience using YouTube for teaching and learning purposes. These are listed below:

Opportunities

- Student feedback and engagement generated by the YouTube videos are valuable.
- The YouTube videos must be carefully planned and on a specific topic.
- Test memos via video explanations give a quasi-tutorial feel which may be more beneficial to learning.
- Showing the process can be better than reading a textbook. E.g. reaction mechanisms which need to 'flow' and not memorised by rote, or three dimensional models which are difficult for all to see in class.

Challenges

- Making YouTube videos takes time. Most of the videos have been made 'on the fly', but even so they involve a number of retakes and editing.
- Students think it is a quick-fix. The videos are meant to complement their learning which can only be an active process. Some think that watching the videos will somehow fill them with knowledge and experience.

Conclusion

Moving forward the lecturer will continue to use this platform and hope to improve the quality and presentation of the videos. The analytics from YouTube have also been interesting and have pointed to videos that have received more hits than others from across the world. This presents opportunities to polish these topics as their demand increases. To date the lecturer has managed quite well with a simple webcam mounted on a clamp-stand from the laboratory, but in the future something a bit more professional with better focus and colour reproduction will be used.

Clickers as performance management tools for student assistants

Faculty of Sciences | Department of Mathematical Sciences

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Learning activity:
Performance management

Learning technology:
Clickers (SUNLearn)

Context

Background overview

In 2014 a better performance management system for Student Assistants was one of the goals identified for the first-year mainstream mathematics courses. There was experimented with clicker technology as a performance management tool. Two modules participated in this intervention namely Mathematics 114 and Mathematics 144. Approximately 380 students were registered per module.

The challenge

Past experience has showed that it is difficult to manage things like punctuality, preparedness and a good demeanour regarding student assistants. These characteristics are essential in giving effective tutor support to the students. Therefore the lecturer recognised the need for a more active, hands-on management system. She wanted to give the student assistants feedback in order to develop their tutoring skills.

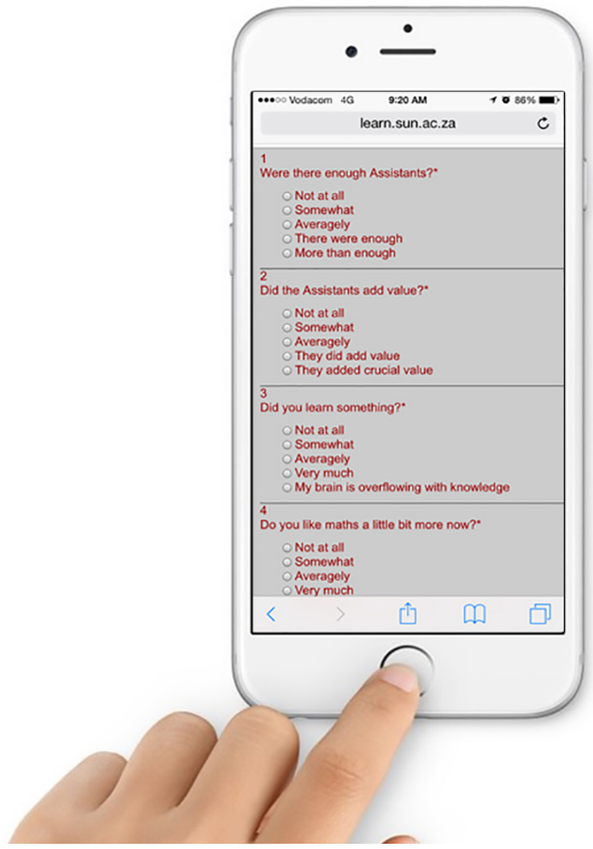
In the past the student feedback form received at the end of the semester was the only feedback received on student assistant performance. It often included complaints related to student assistant behaviour in tutorials, ranging from not being punctual to not being adequately prepared to helping students in a meaningful way. However, as this feedback was only given at the end of the semester an opportunity was missed to develop the assistants as well as improve the support available to students during the semester.

Possible advantages associated with the integration of technology

It was decided to investigate clicker technology as a possible alternative performance management tool. One of the main advantages that clickers allowed was that the assistants' performance could be evaluated on a weekly basis during tutorial sessions. This enabled the lecturer to quickly identify those assistants that were in need of support or an intervention. Additionally, student feedback was easy to collect and instantly available, even from such a large group. It also gave the students a voice and the reassurance that their needs and concerns were addressed. Furthermore, the feedback allowed us to give recognition to outstanding student assistants and made it clear that their positions were taken very seriously. Finally, it served as excellent work experience feedback, which the assistants could incorporate in their CVs.

Learning activity

At the end of each tutorial the senior student assistant in the venue would put up an Excel sheet with multiple choice items for feedback. These items included punctuality, friendliness, preparedness and the favourite Student Assistant for the tutorial. The students would complete the clicker test on their cell phones or other internet enabled devices on the SUNLearn platform. The teaching assistant would then review the feedback at the end of each week and report to the lecturer at their weekly meetings. Struggling assistants were quickly identified and the teaching assistant would meet with them individually and discuss their feedback and ways in which to improve their performance.



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Learning technology:
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Student experience

The system worked very well, to the point that the tutorial is one of the items listed as the best aspects of the two mathematics courses, for the first time. It is believed that the system mentors better student assistants and will pay off in the long run, with more and better student assistants involved in these modules. It needs to be mentioned that it does take a few minutes at the end of each tutorial to get the feedback, but it is a small price to pay for the improvement in the management and development of the student assistant team.

Conclusion

There is scope for extending this feedback to the course in general, i.e. not just feedback about the student assistants, but feedback on the tutorial each week and the material covered, thus becoming a tool that highlights what works and what doesn't during the course, as opposed to only receiving this feedback at the end of each module. It will also be possible to implement this type of performance development system in other modules where large numbers of tutors or students are involved. This type of feedback system is recommended for any course. It makes the management of a Student Assistant team so much easier and ensures that students are provided with the best possible service in tutorials.

Implementation of interactive tutorials using iPads in Physics

Faculty of Sciences | Department of Physics

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Learning activity:
Interactive tutorials

Learning technology:
iPad apps

Context

The iPad is an example of a disruptive technology (Christensen 1997) that has revolutionized our access to information, the sharing of multimedia content and the way we interact with digital data. In addition, the App Store provides a number of high quality educational apps. It is therefore natural to ask what impact this versatile device might have at the higher education level. To answer this question a number of universities have initiated iPad projects.

A methodology for iPad usage in a first-year physics module was proposed (Van der Ventel and Newman 2014) and is based on the idea that there are four key areas where the iPad can make an immediate impact in the educational environment. In this case study they specifically focus on the "Interactive classroom" component.

The efficacy of group work is indubitable in stimulating critical thinking and promoting the development of problem-solving skills (Hicks 1996, Flannelly and Inouye 1998, Distler 2007, Schmidt, Van Der Molen, Te Winkel & Wijnen 2009, Currie, Biggam, Palmer & Corcoran 2012, Davies 2014). A relevant question is thus if the iPad could have a positive impact on the dynamics of group work during first-year university physics tutorials. Seventeen iPads were loaned by Core Computer Group, Authorised Distributor of Apple products, and Digicape, a local reseller of Apple products. Four apps namely, ***Nearpod***, ***Stick Around***, ***BookWidgets*** and ***iCircuit*** were used on these devices, of which three is discussed below.

Learning and assessment activities

This iPad project was run in the fourth quarter of 2014 in the non-calculus-based Physics (Bio) 154 module. It is a service course with an initial enrollment of about 720 students. Each language group has three lectures per week. During the fourth quarter there were four tutorials with three tutorials sessions per week.

A set of problems as preparation for the tutorial session was given a week before the time, with the actual set of tutorial problems available on the preceding Friday on SUNLearn. The tutorial officially ran from 14h00 till 16h00 with a 45 minute test starting at 16h00. During a tutorial session the students would be divided into three main groups namely (i) the iPad group, (ii) the non-iPad group and (iii) the "special needs" group. The latter comprises students who were, based on their Matric and Physics (Bio) 134 mark, identified to be in need of additional assistance. The students who belonged to the special needs group had their own dedicated tutorial assistants and did not participate in this iPad project.

Since we had four tutorials spread throughout the fourth quarter, it meant that we could cover all 190 participating students if we allocated at least 50 students in the "iPad group" per tutorial afternoon. Table 1 provides a summary of how apps were distributed across the 4th quarter.

Tutorial Session	Topic	Apps
Tutorial 5: 22/09, 25/09, 26/09	Electrical forces, fields and potential	*Nearpod, Stick Around, BookWidgets* (for survey)
Tutorial 6: 06/10, 09/10, 10/10	Resistance, electrical circuits and Kirchhoff's laws	*Nearpod, iCircuit, BookWidgets* (survey and tutorial)
Tutorial 7: 13/10, 16/10, 17/10	Membrane potential	*Nearpod, Stick Around, BookWidgets* (for survey)
Tutorial 8: 20/10, 23/10, 24/10	Magnetic forces and fields	*Nearpod, BookWidgets* (for survey)

Table 1: Distribution of apps used for the tutorial sessions.

Learning environment

Nearpod (www.nearpod.com) is an app which is freely available from the App Store but the free version only allows 50 participants. This app is extremely well suited for group work and is based on the idea of creating a ***Nearpod*** interactive session via Wi-Fi. To start the ***Nearpod*** session the lecturer would first sign onto his/her ***Nearpod*** account and obtain a unique pin. The students can then become part of this session by signing on with this unique pin via their iPads. The presentation, which the lecturer created, is then downloaded onto each of the iPads which form part of the particular session. The lecturer has full control over the session as the progression through the slides is completely controlled by the lecturer on his/her iPad. Since access is obtained via Wi-Fi, the participants need not be in the same physical location and thus this app can truly revolutionize

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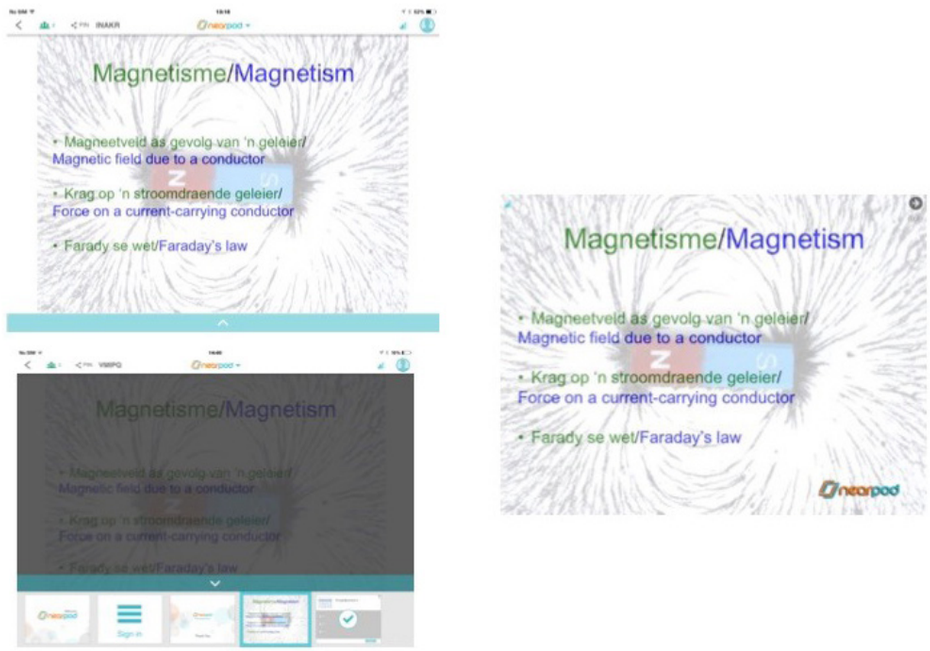
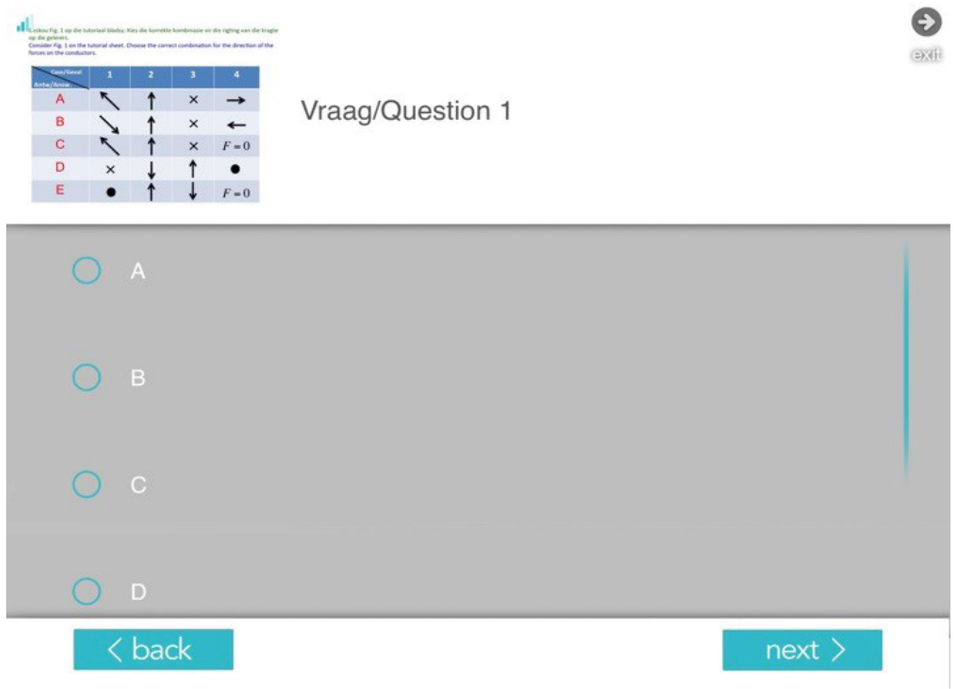
distance learning. The success of the session is unfortunately totally WiFi-dependent and therefore the speed and carrying-capacity of the WiFi connection must be thoroughly tested. Experience has shown that a weak or inadequate WiFi connection can totally destroy a session and lead to a sense of frustration and anger for all (lecturer and students) involved.

Lecturer **Student**



The ***Nearpod*** app was used for group work and all the questions in the tutorial were recast in multiple-choice format. In the figure we show a typical screen for one of these multiple-choice questions. If one taps on the question it will fill the whole screen. You can toggle between a full-screen view of the question or just a ribbon-view. The answers are listed below and the student can make a choice and then move on to the next question.



On screen, the lecturer sees the results while the students are busy with the questions.

	SCORE	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
S1	5/10	3	2	1	4	1	3	2	3	3	2
S2	6/10	3	3	2	4	1	1	3	3	1	3

It illustrates the list of students and the answers they give for each question, using green or red for correct or incorrect answers, respectively. The pie chart shows the distribution for "correct", "incorrect" or "no answer". The feedback is done in real-time and thus the lecturer can immediately see which groups are struggling, which questions are problematic and thus interventions can be made immediately. Here the role of the tutorial

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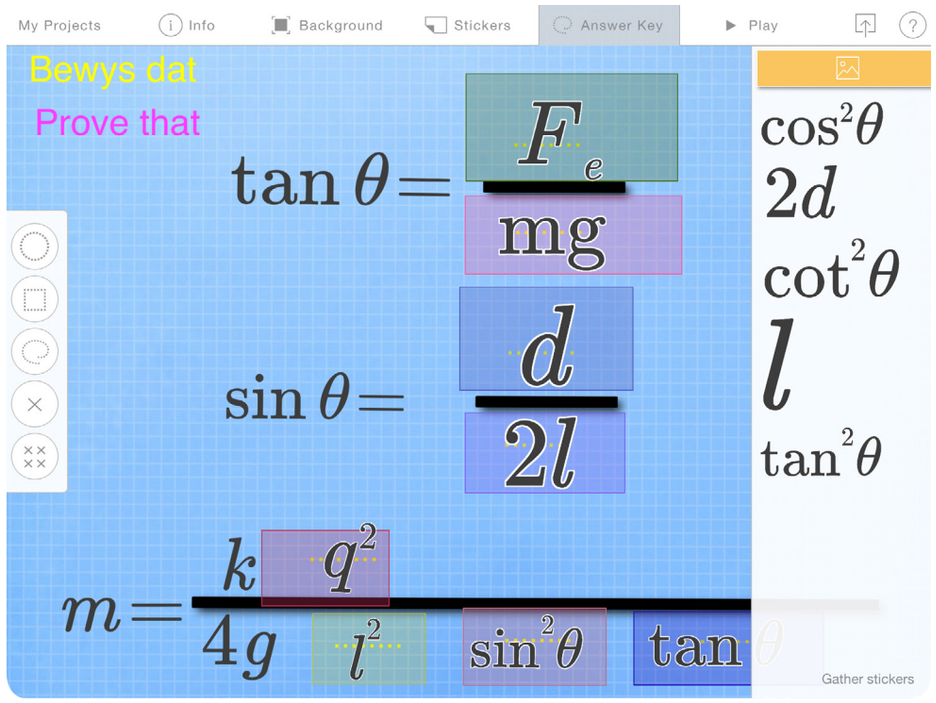
assistants becomes critical. The instant feedback allows one to monitor the progress of the class as a whole and a judicious choice of multiple-choice questions can be very insightful. Our strategy during the tutorials session would typically be to let the groups work on a few problems and then stop to assess the progress. Those questions with red answers were reviewed and care was taken to thoroughly explain the solutions. A complete memorandum of the tutorial was made available on SUNLearn after the Friday tutorial session. At the end of the session, it is possible to generate a report containing some statistics regarding the session, for example how the answers are distributed across the groups and the number of correct answers per group and for the whole class.

Reflections on the *Nearpod* sessions:

- There were no intricate features of the app that the students had to master. They could immediately focus on the physics questions.
- The sessions greatly fostered interaction between the students in the group (see results of survey later).
- The nature of the multiple-choice problems allowed students to immediately identify where their problems with the work lay. This places a great burden on the lecturer to ensure that the problems are well chosen. In addition, modifying a problem in physics (which often-times necessitates a number of algebraic steps) is not that straightforward, even at first-year level.
- The lecture hall used was not really optimal for group work. A venue with a flat surface is preferable.
- Four students per iPad seem to be the limit before it becomes difficult for everyone to see the screen.
- There is a certain "fun" factor when using the iPad during group work.
- Great care should be taken when displaying the distribution of answers for the different groups. Students in a group should not feel as if they are being "identified" as giving the incorrect answers.
- A good practice is to let the students do a few problems and monitor the progress of the class as a whole. Based on the distribution of answers one can then either proceed or first pause and review one or two questions. The great advantage of the ***Nearpod*** app is the immediacy of the feedback. Within the first 30 minutes or so, the lecturer and the class can have an indication of the level of mastery of the work.

Another app, called ***Stick Around*** (http://stickaroundpuzzles.wikispaces.com) was used for group work. This app allows one to create multiple-choice questions in a pictorial way. This is done using the idea of "answer keys" or "puzzle pieces". The use of this app can be quite challenging for the instructor since it is not always that obvious how to pictorially present a problem which entails a number of algebraic steps. The easiest method though, is to implement the solution of the problem in the project creator and then remove "pieces" of this solution and define them to be the "puzzle pieces". This app works very well with pictorial problems such as force diagram or circuit analysis (in a Physics context). The figure shows two screen shots of the ***Stick Around*** puzzle.



The figure illustrates one problem which was divided into two parts. In the first part the puzzle was to identify the various forces acting on the masses. The answers appear as "stickers" which can be dragged from the white ribbon on the right-hand-side onto the canvas. The second part of this problem entailed a number of algebraic steps before the students can

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reach the final answer (an expression for the mass in this case). Here the three relevant expressions are given with placeholders for the stickers or puzzle pieces. These examples illustrate that conventional questions can still be asked within the ***Stick Around*** environment, provided a little effort is put into modifying the question. Note that it still tests the basic skills required of this problem namely (i) drawing a correct force diagram and (ii) algebraic manipulations to reach an expression. However, asking this question within the ***Stick Around*** environment adds a certain "fun factor" which must not be ignored and which renders the tutorial session a more pleasing experience for the student. Support for this statement is shown in the results of the student survey.

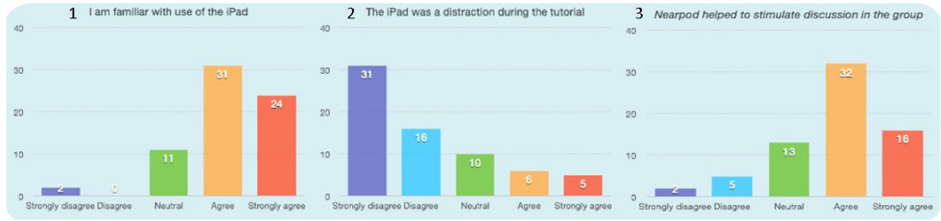
When using ***Stick Around*** the following must be kept in mind: the app allows the student to immediately check the answer after placing the puzzle piece. It occurred a few times that a group would place the stickers, check the result and then use a "trial-and-error" approach until the result is completely correct. This is where the lecturer and tutorial assistants must step in and discourage such an approach. ***Stick Around*** can greatly enhance discussions in the group but the role of the facilitator remains paramount.

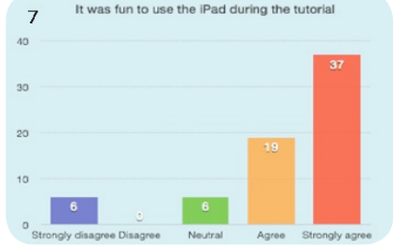
Student experience

To ascertain the success of this pilot program a short survey was conducted after each iPad tutorial session. The ***BookWidgets*** app (https://www.bookwidgets.com) was used for this purpose. The students were asked to evaluate the following statements on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree):

1. I am familiar with the use of the iPad
2. The iPad was a distraction during the tutorial
3. ***Nearpod*** helped to stimulate discussion in the group
4. ***Stick Around*** helped to stimulate discussion in the group
5. ***iCircuit*** helped to stimulate discussion in the group
6. The iPad and apps helped to enrich the learning experience
7. It was fun to use the iPad during the tutorial

The results shown in the figure are only from the Thursday sessions.





Analysis of the other data is still in progress. Question 4 only applies to tutorials 5 and 7. Question 5 only applies to tutorial 6. The students sharing an iPad were asked to reach consensus on each question.

The results are of course qualitative, but it is remarkable to see how many students agree or strongly agree that they are familiar with the iPad. A few did bring their own iPads and chose to use them during the tutorial sessions. There were also a few personal iPad minis and iPhones used by the students. It could be that these students who are familiar with the iPad come from a household with at least one iPad, even though they do not have one for personal use.

The overwhelmingly positive response to ***Nearpod***, ***Stick Around*** and ***iCircuit*** in stimulating discussion in the group is a very encouraging feature of this pilot project. This is definitely worthy of further research, as peer-instruction is a very important part of the learning experience. Note that of these three apps, ***iCircuit*** had the steepest learning curve which had to be

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Learning activity:
Interactive tutorials

Learning technology:
iPad apps

mastered before the app could be used. This had to be done within the 2 hours allocated to the tutorial and yet the students felt that it has a positive impact on the learning experience. This app is very comprehensive when it comes to circuit analysis and it testifies to the fact that a high quality app can have a direct impact on learning. In general the students felt that the iPad and apps enriched the learning experience. The simple "fun factor" when it comes to learning should also never be discounted and this is born out by the survey results.

General

The ***Nearpod*** app can positively impact group work and student-lecturer interaction. It can also revolutionize distance learning since all that is needed to be part of the session is a good WiFi connection. This app also allows instant feedback and both student and lecturer can be fully aware of the level of proficiency on a particular subject. All work can be uploaded to the cloud and synchronized across devices allowing instant access and the learning process can thus continue 24/7. The Apple ecosystem offers a big opportunity, i.e., it provides an authentic way of learning in an increasingly connected world. The textbooks, iTunes U and apps allows for a personalized learning environment. Assistive technology features are included standard and free of charge with the iPad. Content is experienced in an engaging way and the built-in apps allow for content creation. iTunes U offers an exciting opportunity for the University to develop both internal and public content. Students can access this content, which is hosted by Apple, anytime.

The iPad is however, very expensive and in an African context, this probably counts as one of the greatest weaknesses of implementing this device. Of course this is not totally insurmountable as one can always appeal to government or private-sector institutions for sponsorship. In addition, any tablet implementation might be viewed as expensive if it is perceived as an additional expense. If the project is assessed holistically though, and one considers what it can replace, e.g. printing costs, depreciation on printers (not to mention the advantage of using the devices in the first place) the cost of learning per student may remain the same or even decrease, while providing a better learning environment. The cost of the device must not be considered in isolation, but rather the total cost of learning per student. Unfortunately iPads are destructible devices and also prime targets for theft. However, the device has a number of built-in security features to prevent unauthorized access and secure user data.

There are however, a number of factors which threaten widespread iPad usage within the African context. Firstly, there is the large number of students in a classroom. The reality is that we will most probably never reach the stage where each student will have an iPad to use in class. This is due to the fact that the majority of students do not have the financial means to purchase an iPad. It would be however, unwise to disregard the opportunities this device offers for education within an African setting. Governmental or private sponsorship could address the price-issue. Another possibility is that the higher education institution negotiates a special price-plan with one or more service providers that would allow students to purchase iPads at a reduced cost or arrange repayment over a longer period of time. The other alternative could be a deliberate decision by the institution to fund iPad rollout as was done at the University of Western Sydney (Rankine and Macnamara 2014). Coupled to the price of the iPad is the fact that a "knee-jerk" reaction might cause faculty or students to settle for lower-end tablet devices which do not offer the full support as Apple does. For example it was found that lower-end netbook tablets have as a major disadvantage due to the limited computing power they offer (Loch, Galligan, Hobohm and McDonald 2011). Wi-Fi access and the high cost of internet usage are also major threats to iPad usage.

Finally, the use of the iPad however, places a great burden on the instructor to ensure that apps enhance the learning experience. The motivation behind choosing apps must be very clear and the instructor must be thoroughly proficient in the use of the apps. If one decides to implement the iPad then there will most assuredly be a need to revise how the questions are posed and this can be quite time-consuming. The next phase in this study would be to devise more quantitative performance indicators to evaluate the impact of this versatile device in the higher education learning environment.

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Introducing badges in first-year Chemistry

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Learning and assessment activity:
Student motivation

Learning technology:
Badges on SUNLearn

Context

Background overview

The department of Chemistry and Polymer Science offers two first-year Chemistry semester courses (Chemistry 124 and Chemistry 144) to approximately 960 students. These modules serve as both main stream and service modules with most students having to take it as a requirement for their selected (non-chemistry) study programme. First-year general Chemistry students repeatedly mention a lack of interest and negative beliefs about their ability to be successful in Chemistry in addition to pointing out the module's difficulty and high work load in the annual, institutional student feedback questionnaires. Furthermore, a shared concern amongst lecturers in the module is that very few students seem to make the effort to stay up to date with the work outside of examination times.

Subject area and established practice

Chemistry 144 includes basic introductory chemistry topics such as solubility, acids and bases as well as organic chemistry. The approximately 960 students in this large module are typically divided into five groups with a team of eight academics from the Chemistry department taking responsibility for two or three of these groups for a certain block of time.

Formal contact sessions for this module comprise three 50-minute lectures per week as well as six two-hour tutorials and five three-hour laboratory sessions spread over the course of the semester. Formal assessment in this module consists of a class test in the second half of the semester, an examination at the end of the semester, six tutorials, each consisting of an online pre tutorial test, tutorial group work and a multiple choice post tutorial test and five laboratory practicals, each consisting of an online pre-practical test and a practical report. The online tests (tutorial and practical) need to be completed by students before the start of their particular tutorial or practical session and they receive three chances to achieve a best mark which will count towards their performance mark.

Each question in all of the online tests has three generic versions which are randomized (together with its distractors) every time the test is attempted. The main aim of the online pre-tutorial tests is to provide students with additional exercises on the basic chemistry concepts covered in a specific section. In this way they are expected to take responsibility in preparation for a tutorial session which is usually more problem solving based. The main aim of the online pre-practical tests is to motivate students to prepare for a specific laboratory practical using their laboratory instruction manual as well as text book.

The challenge

Students previously did not always attempt their online assessments in time and mostly waited until the last minute to attempt these. They furthermore did not necessarily show to make use of all three allowed attempts in order to use the opportunities as part of a learning process, but rather just concentrated on receiving a mark that is high enough for them, regardless of how many opportunities this took.

Learning opportunity

Badges were introduced in Chemistry 144 during the second semester with the aim to improve student motivation and therefore also participation by awarding of badges in addition to the allocation of marks.

Pre-prac exercises:

- The Blue Flask = Full marks for the first pre-prac.
- The Bronze Flask = Full marks for any two pre-pracs in a row.
- The Silver Flask = Full marks for any three out of the five pre-pracs.
- The Golden Flask = Full marks for all five pre-pracs.

Pre-tut exercises:

- The Blue Mole = Full marks for first pre-tut.
- The Bronze Mole = Full marks for any two pre-tuts in a row.
- The Silver Mole = Full marks for any four pre-tuts.
- The Golden Mole = Full marks for all pre-tuts.

Tutorials:

- The Blue Einstein = Full marks for first tutorial.
- The Bronze Einstein = Full marks for any two tutorials or where you have improved on a previous tutorial.
- The Silver Einstein = Full marks for any four tutorials or where you have consistently improved for four tutorials.
- The Golden Einstein = Full marks for all six tutorials or where you have consistently improved in all six tutorials.

Clicker participation:

The Blue Cellphone = If you have participated in 2 clicker activities.
The Bronze Cellphone = If you have participated in 4 clicker activities.
The Silver Cellphone = If you have participated in 6 clicker activities.
The Golden Cellphone = If you have participated in 8 clicker activities.

Introducing badges in first-year Chemistry

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Student experience

SUNLearn allows for the awarding of badges for tasks completed in a course and were therefore used for this purpose. Out of the total of 16 badges, 1156 awards were made during this course. By pre-setting the criteria most of the badges could be awarded automatically through the SUNLearn grade book. There was however 5 badges that were awarded manually, which was quite a time consuming process.

To evaluate the impact that the badges made on students' motivation in this course, quantitative data was obtained from SUNLearn regarding student participation in the course's online activities. These were compared to the participation of this same group of students in the previous semester (Chemistry 124), when badges were not yet implemented.

Online task	Term 1	Term 2
Preprac 1	44%	41%
Preprac 2	36%	40%
Preprac 3	32%	32%
Preprac 4	41%	41%
Pretut 1	37%	31%
Pretut 2	36%	32%
Pretut 3	27%	25%
Pretut 4	33%	44%
Pretut 5	32%	45%

This figure compares the participation of students during the first (Chemistry 124) and second (Chemistry 144) semesters. It shows the percentage of participating students who attempted the prescribed online tasks three times. Students who obtained full marks on their first attempts were removed from this analysis.

Unfortunately, this data does not show any noticeable change in the students' participation in the online activities. As mentioned earlier, the students each had three available attempts per activity in order to obtain the best possible mark. It makes sense that if a student obtained full marks in their first attempt that they will not repeat the exercise. Therefore, taking this into consideration we unfortunately found that the number of students who attempted the online activities a total of three times does not differ much between the two semesters.

In addition to the quantitative data, qualitative data was collected by means of a questionnaire. The results provided valuable insight regarding the potential use of badges to increase the motivation of students to participate more in online tasks and to thereby improve their understanding of chemistry. Not surprisingly, very few of the students have ever participated in online activities where similar awards were allocated. However, they also did not realise that they had to claim their badges after it was rewarded. Unfortunately, this meant that these students did not see the badges in their personal profiles, which some of them mentioned were a bit discouraging. Still, the majority of students were very positive about the idea of the introduction of badges in Chemistry 144 and did report this intervention to act in a motivational way.

Conclusion

This first attempt at the use of SUNLearn badges to motivate student learning through participation in online tasks has excited us about the potential of this fairly new development. We are currently exploring research on this topic in order to guide our future plans.

Tablets to promote active learning in the EDP biology flipped classroom

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Learning activity:
Flipped classroom

Learning technology:
Tablets

Context

Background overview

In 2014, the Extended Degree Programme (EDP) biology class consisted of 109 students, studying a variety of B.Sc. degree courses in the faculty of Science at the SU. The Department of Botany and Zoology is responsible for the BIOL 146 module, which is intended to introduce the following biological concepts to these students: 'What is life?', biological evolution, biodiversity, the 'Tree of Life', the chemical basis of life, biological molecules, enzymes, biological membrane structure and function, cell structure and function in pro- and eukaryotes, as well as animal- and plant cells, Mendel, genes and inheritance, introduction to animal phylogeny and lastly vertebrate life.

Possible advantages associated with the integration of technology

Research has shown that active engagement of students in purposeful academic activities advance academic outcomes and the overall progress of students. Moreover, many researchers regard student engagement as one of the key pillars of higher education. One way of promoting student engagement is by encouraging active learning activities where students can engage with learning material in meaningful ways through reading and reflection, talking and listening activities, as well as writing and thinking. Direct interaction between students and subject related learning material therefore replaces the lecturer with the student, as the active party in the learning experience.

The model of the flipped classroom is an example of active learning, characterized by high levels of student engagement. In this case, the role of the lecturer switches from being the active role player 'delivering' the information, to a facilitator of sessions where students are encouraged to take ownership of their own learning process. Students often watch video's or are required to prepare reading material, which is then followed up by group discussions and a variety of other activities. This method typically allows lecturers to gauge the degree of learning taking place and enable them to correct any misconception immediately. This method also creates a platform for discussions and 'playing with ideas' which in turn leads to inspiring, innovative and communal classroom climates, conducive to learning.

Students of today are also known as the Net Generation as a result of being born into a world dominated by technology. A study by Barnes, Marateo and Ferris (2007) proposed that these students are autonomous learners who rely greatly on instant gratification and quick access to information. Lecturers are therefore urged to take advantage of these media for educational purposes. With universities finding themselves increasingly more is a highly competitive arena in education in recent times, finding innovative ways of actively engaging modern students, might therefore be the decisive edge. Our introduction of tablet PCs into the EDP biology is one first step in this direction. Our aim is therefore to firstly find ways in terms of methods, apps and programmes to engage these biology students in active learning experiences by flipping the classroom. Secondly, to evaluate the impact of this intervention on student engagement and learning on the following levels: concepts, ways of experiencing and approaches to learning, as proposed by Case (2008).

Students attend three classes (1hr each), as well as one practical class (3h) per week during this module. The module is presented by one lecturer (Dr. Marnel Mouton) with a teaching assistant (Mr. Edward Archer) to one English and one Afrikaans class, during the second semester of the year. Twenty tablet PCs were purchased using a FINLO grant to be used in these classes. Students worked in groups of two to three and students with their own tablets were encouraged to use them during these activities with the learning material loaded onto SUNLearn.

Learning and assessment activities

Learning activities

This study commenced in middle August of 2014. Classes in this module were presented in a variety of ways with the aim of raising student engagement. These included lecturing using PowerPoint, group work using the jigsaw method, preparing video's to cover certain topics, quizzes, open book tests and playing 30 Seconds to impart the fundamental biological concepts and terminology. The tablets were then introduced to enhance the learning experience even further and activities used to date and planned for future use are presented in Table 1. Lecturers are in the process of exploring additional apps that are aimed at combing lecturing and active learning activities in such a way that students would be able to raise questions via the tablets or even 'flag' topics/concepts that are not understood, in real time.

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Learning activity:
Flipped classroom

Learning technology:
Tablets

Tablet computer preparation	Tablet computer assignments and activities
1. Information was uploaded onto tablets and students had to complete an appropriate assignment.	Jigsaw: Different themes were loaded onto different tablets. Students in one group did an assignment on one topic, while students in other groups researched other topics. At the end, students from different groups shared their findings with one another on their related topics and contributed to one central theme. Group Sharing: Different topics were loaded onto every tablet. Every member of a group studied one topic which was shared in the end with all members of the group.
2. Video material was uploaded onto the tablets or students accessed a video via a web link where after students completed an appropriate assignment.	Timeline: Students constructed a timeline of events as they occurred in the video presentation. Group Sharing: Students worked in groups and every member of the group took responsibility for a certain topic covered by the video presentation. Topics and data were shared after group discussions and eventually covered the complete topic presented in the video.
3. No preparation activities.	The tablets were used in clicker tests and surveys. Video Presentations: Students prepared their own presentation using the tablets where after video presentations were shared with and assessed by fellow students in the class to also promote peer instruction.
4. Information and video clips were loaded onto tablets that were placed at specific stations in practical classes.	The tablets were used during practical classes to supply additional information or video material on specific topics at certain work stations. Information was accumulated by students over the semester to be used in an open book practical exam at the end of the semester.
5. E-books were uploaded onto the tablets and students were given various assignments to complete from sections in the book.	Brain maps and diagrams: Students compiled brain maps or schematic representations of certain concepts. During these exercises students learned to research and summarize information while learning about the topic/concept itself.
6. Course applicable apps were uploaded onto the tablets to illustrate certain processes.	Students had to complete certain levels of course applicable gaming apps.

Table 1: Tablet activities used/planned during active learning experiences in the class.

Assessment activities

Assessments evaluating the impact of the intervention included clicker tests, open book tests, semester test results, as well as open ended

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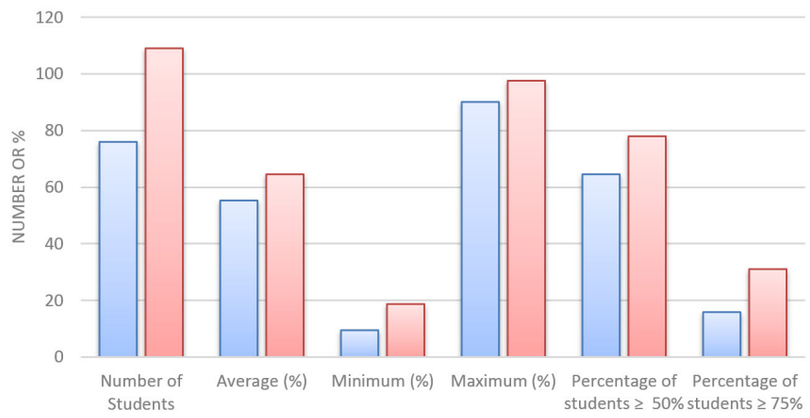
interviews with randomly selected students from the class. By the time the class reached the final two topics of the module, the lecturer had a good idea of how to structure classes and assessments incorporating the tablets. Both these topics were taught in 2013 in the more traditional lecturing way, whereas in 2014 blended learning techniques were used. Consequently, semester tests covering these two themes from the two year groups could be compared.

Student Experience

Preliminary assessment results

Comparing semester test results between the two year groups of 2013 and 2014 showed that the average mark was notably higher after that intervention of the tablets; 55.2% and 64.6% respectively. The minimum and maximum marks (%) were also higher, as well as the percentage of students scoring ≥ 50% and ≥ 75%. Since the learning material for the two tests was identical and the tests were comparably similar, it appears that the intervention indeed had a positive impact on the amount of learning that took place. However, more research is needed to make meaningful conclusions.



COMPARISON OF 2013 AND 2014 TEST 3 RESULTS

Student Feedback

To assess 'ways of experience' and 'approach to learning' in the EDP biology class, open ended interviews were conducted with students from both EDP biology classes. These conversations dealt with the use of the tablets and other ICTs, but also how students experienced classes and their approaches to learning biology.

Generally, students were very positive about their experience in this biology class. The biology classroom was perceived as relaxed, fun and conducive to learning. They enjoyed using the tablets but felt that combining it with other active learning activities, made it even more effective because the fun and anticipation aspect could be retained. Group work was perceived as a positive experience and the students felt that it was because they had a choice in selecting group members that they were comfortable with, and who would work together more constructively. Students found the formative assessments very valuable to determine what concepts had to be worked on or explained again.

General

An ideal classroom setting would provide one tablet per student in class. However, with logistical issues accompanying the transport of such a number of tablets between teaching venues, one tablet between two students should also work well. At the moment, the lecturer is in need of additional tablets to account for the growth in student numbers. Moreover, when the Wi-Fi system is upgraded in all class venues on campus, the use of the tablets can be maximized and should lead to a whole new and even more effective learning experience and environment.

This experience and data gathered to date show that using tablet PCs in class has the potential to revolutionise teaching and learning, since it allows alternative engaging methods and therefore another level of teaching. Student engagement is notably higher and the learning of fundamental concepts therefore more effortless. It unquestionably adds another fun aspect to learning and delivers a much wider scope to active learning activities in the flipped classroom. With new apps becoming available all the time, the teaching team are currently experimenting with apps that will allow real time interaction with the slides in class by both the lecturer and the students. To access impact on learning, more research is needed although our preliminary findings show positive prospects. In future, universities will need to act strategically to compete with competitors such as MOOCs. Using innovative teaching methods, such as tablets PCs in flipped classrooms in combination with other active learning activities to dynamically engage students, may provide a vital competitive edge.

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Use of learning technologies in the Masters of Divinity programme

Faculty of Theology | Department of Practical Theology

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Context

Subject Area and Background Overview

The Master of Divinity (MDiv) in Church Ministry and Church Leadership (55735:889) is a full year, multi-module programme in the Department of Practical Theology that focuses on training theology students for various facets of ministry. In 2014 the programme had 23 enrolled students (8 female and 15 male) between the ages of 22 and 32, most of whom had completed their necessary Bachelors in Divinity (BDiv) or equivalent degrees at this same faculty.

Students are expected to be available for a full day of classes from 08h00 to 16h30 and are expected to attend every lecture, seminar or other face-to-face classroom scenario, as well as off-campus excursions and activities. The learning environment also consists of the university based learning platform *SUNLearn* where the students are expected to complete and submit assessments, group activities and reflective exercises (Nell, 2014A:3).

Topic, Intended Learning Outcomes and Established Practice

Primarily and administratively situated in the Practical Theology department this programme incorporates all of the departments of the Faculty of Theology, namely Practical Theology and Missiology, Old and New Testament Studies, and Systematic Theology and Ecclesiology. In so doing the programme, using a "hermeneutical-rhetorical meta-theoretical framework", provides the student with a comprehensive knowledge-integration of their previous theological BDiv content with a specific focus on equipping them to use it responsibly and professionally as "ministers, clergy, pastors, lay workers, pastoral care givers and pastoral therapists for the ministry" (Stellenbosch University, 2014:44&45).

The programme consists of three main practical-theological themes, namely *Pathos, Logos* and *Ethos*. Six core modules (120 credits) are grouped under these main themes and these modules are further subdivided into (30) smaller practical-theological ministerial themes (referred to as teaching blocks in the faculty colloquia). Teaching blocks are individually assessed and forms part of the core module's credit load. A research component (60 credits) is included as a seventh core module. The students are required to complete a research assignment of 50 pages in any of the faculty department in order to further develop their skills in research methodology and knowledge of theology as science.

The programme (180 credits in total) is designed and structured in order to equip the students for professional ministry. Each block is structured according to the needs of the lecturer with regards to days of face-to-face classroom time, frequency and type of assessment and use of *SUNLearn*.

The students complete a 48-hour outcomes-based assessment at the end of the programme. This is structured in such a way to help them with the integration of abovementioned outcomes into their knowledge base.

Student overview and role of other course users

In 2014 there were 23 enrolled students in the MDiv-programme. Of these 23 students 21 completed their undergraduate (BDiv) degrees at this same faculty and were therefore familiar with the building, the lecturers and the technological infrastructure (the faculty has its own computer area where students can have access to desktop computers throughout the day and night). The other two students completed a faculty-based postgraduate diploma (PGDip) to gain access to this programme, they were therefore also familiar with the building and the available infrastructure- but perhaps not the lecturers as much. The 21 BDiv students had experienced both the university-wide transition from *WebCT* to *Blackboard* and from *Blackboard* to *SUNLearn*, and therefore knew how to navigate the latest learning platform. It is unknown whether the two PGDip students were familiar with the use of learning platforms, but they seemed to manage with the help of the lecturers and their peers.

Other programme participants included a programme coordinator and convenor situated in the Practical Theology department, 19 lecturers from the different departments in the faculty, and a university-based technical support person. Later in the year a university-based advisor from the Centre for Teaching and Learning as well as a faculty-based technical assistant and assessor (currently known as the blended learning coordinator) joined the programme to provide advice and feedback during the programme evaluation. The programme coordinator, blended learning coordinator and blended learning advisor formed the workgroup.

Use of learning technologies in the Masters of Divinity programme

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Learning activity:
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The challenge and possible advantages of the integration of technology

From the provided information it is clear that the MDiv-programme is a fully loaded and intricately structured academic programme that attempts to provide students with "*a theological understanding of congregational ministry and the distinctive character of being a church in various contexts.*" (Nell, 2014A:2) By making use of all the theological departments in the faculty and by using the student's undergraduate studies as a knowledge base the programme endeavours to provide students with theological knowledge-integration that will be an integral part of their success in their future professions.

The abovementioned view is a theoretically sound rationale but it is practically quite challenging to structure coherently and cohesively. Although the six core modules are structured neatly according to the three main practical-theological themes of *Pathos*, *Logos* and *Ethos* the smaller teaching blocks, with their weekly or bi-weekly shift of lecturer and theological theme, create a sense of structural and academic disjointedness and incoherence. As every teaching block has its own structure, assignment and form of assessment that contributes to the credit load of the overhead module it also leads to a very production-laden programme, which in turn can lead to the issue regarding quantity versus quality teaching and learning.

To address the structural and academic disjointedness and incoherence, as well as the issue regarding production and assessment overload (which affects students and lecturers alike), the workgroup decided to make better use of the available university learning platform *SUNLearn*. By using *SUNLearn* more productively and strategically as a teaching and learning tool they envisioned to create:

- A virtual classroom that would run parallel, synchronous and asynchronous with the face-to-face classroom to help create a multitude of communication, teaching and learning spaces.
- A standardised, practical layout for every teaching block in order to create a unified and easy to use structure that would make navigation simpler and create a sense of academic cohesion.
- An opportunity for the different lecturers to be able to see what and how the other is teaching, where there might be overlap in academic material and therefore collaboration in terms of integrated reading material and/or assessments that would lessen the production burden on students and lecturers.

The workgroup therefore motivated lecturers to make as much use of *SUNLearn* as practically possible in order to address the challenges and achieve these envisioned goals.

Learning and Assessment Activities

Educational approach

The MDiv-programme is a full time programme that requires students to be present at the classes assigned to the specific teaching blocks. *SUNLearn* is used, according to an instructional design model, parallel and synchronously with these face-to-face classes to act as a complimentary teaching and learning platform. It is structured, organised and implemented therefore in order to help produce the programme outcomes, as well as to address the challenges of the programme.

Learning and assessment activities

The learning and assessment activities incorporated into the learning platform should be carefully chosen and thoughtfully implemented in order to assist students with knowledge acquirement and the use/development of necessary skills (Engelbrecht, 2003:41). It is in these spaces that the students critically engage with theory and praxis to create a profession-based skill set. With this in mind each teaching block chose and implemented the necessary teaching practice and assessment activity to best accomplish this task. Although the different blocks may use similar activities they did so with a different rationale and also assessed the activities according to different criteria.

Activities in this programme consisted of:

- Watching videos that pertain to the academic content.
- Reflecting on classroom discussions and literature by using the 'Workshop' activity.
- Writing blog posts and journal entries (using the 'Forum' activity) to reflect on their experience of the literature and classroom discussions.
- Group orals that were presented in class and could be loaded onto *SUNLearn*.
- Traditional assignments reflecting on and researching the academic

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Learning activity:
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Learning technology:
SUNLearn

content presented.

These activities often had the dual purpose of being a formative learning tool as well as a summative assessment tool. They were therefore incorporated into the teaching practice but also served to help students receive marks as the teaching block progressed. This was very well received by the students as it challenged them to learn and think in different ways, but also diffuses the academic pressure of producing one big assignment at the end of the block.

Some teaching blocks did not make use of the learning platform on an activity level but only as a literature repository. Although this made access to the literature easier it did not help create the envisioned multitude of communication, teaching and learning spaces. The workgroup found that showing these lecturers the different teaching and assessment styles implemented on *SUNLearn* helped them to see the potential uses of different activities and realise the easy implementation of them.

Feedback practice and student self-regulation

Feedback was provided directly via the learning platform activity in the form of a mark. Very few lecturers provided comprehensive feedback as a learning tool due to time constraints. Where the activities constituted the bulk of their mark allocation (in the case of a traditional assignment or lengthy blog post) feedback was provided more comprehensively on the activity. Feedback was also often provided orally in class and gave students the opportunity to respond to the feedback given, but there were no formal activities created to implement student self-regulation (i.e. the opportunity to resubmit work after the first feedback or the use of peer-review as a summative feedback tool). There was only one formal instance of the use of peer-review as the opportunity for the students to provide each other with feedback.

Feedback and response to feedback was lacking in the programme structure and something that is being addressed by motivating lecturers to make more use of *SUNLearn* activities that make use of immediate feedback or peer-reviewed feedback.

Learning Environment

Learning settings

Learning activities took place within the classroom where lectures and face-to-face discussions took place. For those who made use of the learning platform *SUNLearn* became a complimentary learning setting that brought the teaching and learning activities into the outside world of the library, home, coffee shop, etc. Students responded well to the individual blocks who made integrated use of *SUNLearn* into the classroom activity, and the participating lecturers found it to be a useful cohesive link to indicate the coherence of what was taught in the class and then assessed or discussed at another stage.

One of the stumbling blocks for more integrated cooperation between the actual classroom and the learning platform seemed to be the lecturer's interpretation of the use of the learning platform. Although many used *SUNLearn* for assessment, discussions and literature repositories it was not seen as a classroom teaching aid or lecture organiser and students did not often see the lecturers physically using the platform (i.e. in a classroom setting or doing the assessment in real-time using *SUNLearn*).

In order to structure the entire programme and each teaching block for optimal classroom use the programme workgroup designed a standardised, practical layout for structuring each teaching block (this framework is created by the technical assistant to the programme, lecturers are responsible for adding the necessary activities and resources). In so doing the workgroup envisioned to achieve an easy to use online module framework which had the teaching, learning and assessment activities embedded. This would mean that the lecturer would not need to create separate class notes but could add it to, teach and distribute from the learning platform. Because each block is structured similarly every student would know exactly where to look for the necessary information or activity. The *SUNLearn* site therefore becomes the module framework, the classroom and the discussion place-all in one convenient location.

This layout and structure has recently been implemented. According to informal polls and feedback from the students it seems to work well, creating a sense of overall structure, cohesion and coherence of the fragmented programme. Lecturers have also found it very helpful as it provides them

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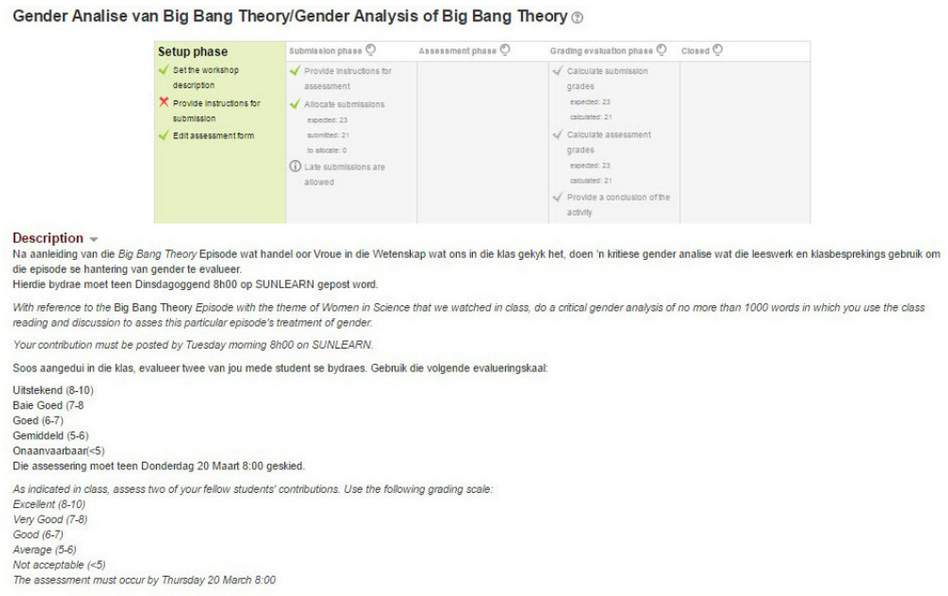
Learning activity:
Programme redesign

Learning technology:
SUNLearn

with organisational structure. It also lessens their administration, as their module frameworks are organised and created for them and they simply have to add the necessary activities and resources to different sections.

Collaborative settings

There are not many collaborative activities formally used, apart from a few classroom group sessions and a collaborative peer-review activity



One of the workgroup's goals of using *SUNLearn* is to give the lecturers an overview of each one's teaching plan in order to provide insight into where (if at all) some teaching blocks can collaborate in terms of reading material, assignments and assessments.

Although this has become easily possible through the programme's simple *SUNLearn* structure and even though it carries some advantages for lessening teaching and learning loads, not many lecturers have made use of this aspect. This could be due to the fear that their subject would have to share valuable time with another or due to time constraints in restructuring the two different teaching blocks into one assessment or assignment. Currently the only solution seems to be for the blended teaching and learning coordinator to initiate and facilitate the process with the different lecturers.

Technology resources

Most students have their own laptops and/or tablets and are encouraged to use them in the classroom when necessary (i.e. for *SUNLearn*-based activities, access to reading material, use of search engines, etc.). A big challenge is the lack of Wi-Fi in the classrooms and plans are being made to remedy this.

Although *SUNLearn* has many activities available for teaching and learning not all of them are usable on a postgraduate level, i.e. 'Choice', 'Questionnaire' and some forms of the 'Quiz'. There are mainly 5 *SUNLearn* tools that are recommended for this programme:

- Turnitin Assignment 2
- Wiki
- Workshop
- Survey
- Forum

These 5 are the most conducive to theological teaching and learning at postgraduate level. By using mostly these activities students and lecturers become quite skilled in the activity's functioning and problem-solving. Informal feedback has been positive in this regard.

Support challenges

One of the biggest challenges to the programme's use of *SUNLearn* was the inability of many lecturers to functionally set up and use the activities and tools. This has been addressed by appointing a blended learning coordinator for the faculty who also oversees the MDiv-programme's learning platform. This has also proven to be an asset to the students in terms of problem-solving.

Conclusion

The use of a learning platform has proven to be advantageous for the MDiv-programme as it provides a centralised teaching and learning platform that is not bound to a physical location. In this way teaching and learning is a continuous process that stretches farther than a face-to-face lecture and transitions into the already technologically engaged lives of

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the students. It also provides all users with a centralised communication space. Technical and e-learning support seems to be the one main factor in making the use of *SUNLearn* in the MDiv-programme practical and sustainable. The presence of an e-learning coordinator who works closely with the programme lecturers and their curricula, could therefore be quite helpful in a similar programme.

A big stumbling block is creating a willingness of all teaching users to partake in the restructuring of the programme. This is imperative if the programme is to function optimally in different teaching and learning spaces. Regular feedback, even informally, is crucial in assessing a) what each lecturer and teaching block needs to achieve their teaching outcomes and b) how each student holistically experiences and learns from the different e-learning tools. It is important that the entire programme works together to create a space for holistic and critical knowledge and skill acquirement.

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BLENDED LEARNING CASE STUDIES 2014

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