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Faculty of Natural and Agricultural Sciences

Fakulteit Natuur- en Landbouwetenskappe • Lefapha la Disaense tša Tlhago le Temo

A smörgåsbord of (potentially) good ideas!

Origins of this bulletin *# inspiration*

Rory Biggs (Department of Mathematics and Applied Mathematics)

I had just launched a virtual bulletin board for our first-year calculus course (WTW114) earlier this year when I wrote to Ina Louw to share the fun and to thank her for inspiring the idea. This soon led to a discussion on how we could share these kinds of (sometimes even minor) "innovations" within our T&L community. A few emails back and forth and the idea for a bulletin was born. Before long, I had created a mock-up, which we presented to Marietjie Potgieter—with her encouragement, it was full-steam ahead! Accordingly, I asked some of my immediate colleagues to each contribute a piece to this opening edition; Ina also kindly assisted with finding some people from other departments to contribute. I was pleasantly surprised by some of the innovations taking place in our department (and faculty) that I had been unaware of. A few months later, we are ready to launch the bulletin.

Many thanks to all the contributors! I sincerely hope that this bulletin will provide another forum (in addition to the various scheduled talks we have) for sharing thoughts and innovations, along with practical information, on teaching and learning across NAS.

Using social media to convey conservation messages *# beta phase*

Adrian Shrader (Mammal Research Institute, Department of Zoology & Entomology)

By its very nature, conservation biology stands at the intersection of science, policy and practice. Thus, to be effective, scientists need to be able to convey their research to the general public. However, very few of us have ever been taught how to do this. To try and rectify this, I had my third-year conservation ecology class (46 students) do individual social-media projects on conservation issues they were passionate about. They were given a choice of doing a video, podcast, or blog. My rational was, that these are key ways in which many people obtain information today, and the ways in which today's students are communicating. Moreover, I figured that this would be something fun and a bit different to what the students normally do in modules.

At the start of the term, I met with the class so that they could decide on the target audience, and the length of the videos, podcasts and blogs. I let the class decide (with some guidance) so that they were part of the process. Once these guidelines were decided, the students then came up with their topics (one per student) and posted them on ClickUP. They then wrote a 250-word abstract, which helped them focus and gave me an opportunity to provide feedback. When they finished their blog/video/podcast, they uploaded it to Turnitin, YouTube, or Google drive, respectively. Once all the projects had been submitted, I had each student mark 20 of their classmates' projects (randomly selected), using a simple rubric that I provided at the start of the term. In addition to getting them to participate in peer-marking, this exposed them to several conservation topics that I did not cover in class. I then took the mean peer mark for each student and incorporated it into their final project mark.

Overall, the projects that the students generated were great (click these links to see a few samples video 1, video 2, video 3, video 4, blog 1, blog 2, blog 3), and student feedback indicates that they really enjoyed the assignment. Based on this success, I believe that students gained valuable insight into how to communicate with the general public. As a result, I'll be continuing this project over the next few years and would encourage others to incorporate similar types of projects into their modules.

Herding cats with clickUP *# clickUP, you make us purr*
[Ansie Harding (Department of Mathematics and Applied Mathematics)](#)

They say that to organise mathematicians is like herding cats. Organising a group of 1500 first-year Engineering students is no different. We claim to have herded these students more successfully last semester than ever before. Here is how.

Apart from attending lectures, these students are required to attend one practical session per week. Practicals happen in the afternoons, four days a week, and the groups comprise between 50 and 150 students. Students traditionally became creative in either skipping practicals or leaving early or even roaming between sessions. The obvious thing to do is to have them write a short test at the end of every session, but the marking load involved in doing this is prohibitive for such a large group.

The clever plan that was put in place has always been staring us in the face, but was only noticed at the start of this year.

ClickUP has a sign-up feature that we had never used before. We called in the help of Alastair Smart (the Instructional Designer for EBIT) and quickly devised a system. Firstly, students were requested to sign up for a particular session, which fixed their roaming habits and also gave them a sense of belonging. Initially, there was a bit of chopping and changing between sessions, but it was all manageable. Secondly, we scheduled a clickUP test at the end of a session, which of course requires no marking. This was alternated with a written test, making the marking manageable and ensuring that they could write mathematics.

Now here is where the clever bit comes in. We made the clickUP tests password protected, devising a different password for each of the four afternoons whenever a clickUP test was scheduled. So you could only write in the session that you were signed up for, and only if you knew the password. The password was announced at the end of the practical session, so students had to stay until the end.

It was noticeable and actually quite amazing how this structured approach quickly changed the culture of the practical sessions into one of accepted compulsory attendance and working seriously right up to the end of the session. Receiving the password at the end of the session seemed like receiving an award.

Video lectures with Doceri *# trying out*
[Eder Kikianty (Department of Mathematics and Applied Mathematics)](#)

I love watching video tutorials to learn something new. The ability to pause, rewind, stop, and play a recorded video helps to replay important points. One cannot miss something, as long as one has the time to go back and replay.

After some minor success with recorded lectures during the disruptions in 2016, I have been thinking about a way to make recorded lectures work better. The answer is clear: short "bite-size" video tutorials. These videos are intended to complement the (scheduled) lectures. The students are not obliged to watch these videos as part of the course, but they may gain something from them.
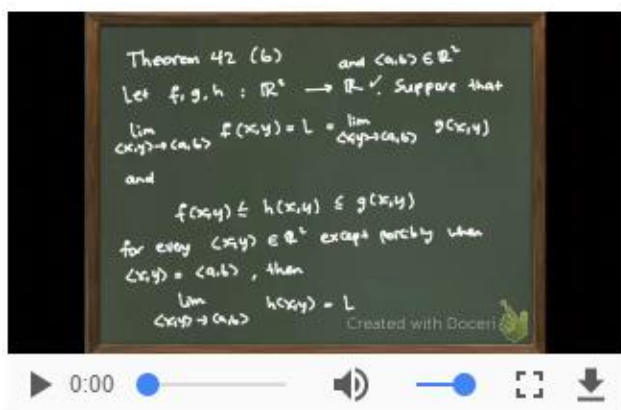
My video tutorials cover proofs of theorems and challenging examples. Students can always replay a section that might not have been clear at first; consequently, they cannot miss an important part of an argument or proof. The length of a video is (typically) not more than 15 minutes. I use the [Doceri](#) app on [iOS](#) to record these videos (a paid version of the app is also available for [Windows tablets](#)).

[Doceri](#) is a professional interactive whiteboard tablet app with sophisticated tools for hand-drawn graphics and built-in remote desktop control. Originally designed for

teachers, [Doceri](#) is used by creative individuals in myriad roles and professions from education to entertainment.

To record a video, it is a simple act of tapping the record button. One needs to use the built-in microphone to record one's voice and a stylus to write. In the video, the students are able to see my handwriting on the "blackboard" and hear my voice narrating over it.

Some students have commented that the videos are helpful. They have also requested me to provide more videos.

Weekend workshops *# tried and tested*
[Harry Wiggins (Department of Mathematics and Applied Mathematics)](#)

One way of working towards finishing your degree in minimum time is to aim for good marks in semester tests and exams. This is very important as these activities normally contribute a large portion of your final mark in most undergraduate subjects.

To emphasize the importance of these tests and to #motivate WTW114 students, I have been hosting voluntary two-hour weekend workshops for several years now, normally two to three weeks before these landmark course activities on a Saturday.

The idea is not to cover all the content for a semester test or exam, but to highlight some problem areas/topics and to alert students to the fact that, unlike school, you cannot start studying three days before the semester test. Rather sooner than later. #MakeTodayMatter

I normally book a large venue, like Large Chemistry, as the attendance is always amazing and surprising. The workshops have a wonderful vibe of learning and reflecting on the content together with students. The students are very thankful for this extra opportunity to engage with the content.

Time out sessions *# didactical contract*
[Karin Bothma (Department of Mathematics and Applied Mathematics)](#)

In short, the didactical contract refers to the agreement about responsibilities and roles that exist in a teaching/learning environment. First-year students find it difficult to transition from secondary to tertiary mathematics education, because of a shift in roles and responsibilities. At tertiary level a new didactical contract, characterised by students taking ownership of their learning, must be established by the lecturer. Interactive learning activities provide the lecturer with opportunities to communicate expectations about a shift in responsibility.

I incorporate so-called time-out sessions to substitute one weekly lecture. For a time-out session, students have to complete a worksheet and write a clickUP test on the worksheet on the day before the lecture. During the lecture clicker questions designed for conceptual understanding are utilised, in combination with peer instruction, to fine tune the students' understanding of content covered in the worksheet. Instead of passively listening, the students are "forced" to prepare and participate.

On average 86% of the students indicate that they did prepare the worksheet. The time-out sessions are lively and students enjoy the opportunity to actively participate. From my perspective, the time-out sessions allow the opportunity for stimulating deeper understanding, because lecture time is used for exploring and not introducing concepts. There is evidence of a shift towards students taking ownership of their learning and thus changing the didactical contract.

Find out more about clickers here: [YouTube video](#), [Vanderbilt University webpage](#).

E-Tutor sessions in Blackboard Collaborate *# tried and tested*
[Lou Pretorius (Department of Mathematics and Applied Mathematics)](#)

When I retired at the end of 2015, the Department of Mathematics and Applied Mathematics offered me an E-tutor contract to tutor the WTW114 and WTW128 students from my new home in Cape Town. I was very reluctant to commit to this level of digital teaching, but Dolf Jordaan came to the rescue, installed the BlackBoard Collaborate software on clickUP and convinced me that this real-time learning environment is not much different from the lecture hall.

During an E-tutor session, I communicate with the students (anything between 15 and 80 of them) by audio and by writing on a whiteboard with a stylus or my finger if the stylus doesn't work. The students use the chat facility.
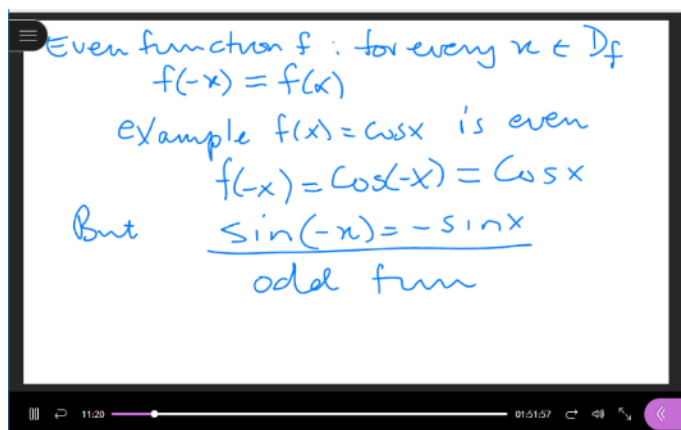
They ask questions, give answers and make comments like "I am lost" and "Explain again". The sessions are also recorded. I only tried once to watch one of these recordings!

The polling tool is a useful communication facility. I can display a multiple-choice question from an old paper and then interact with the students by using the polling tool. The displayed question on the whiteboard is user-friendly in the sense that I can write on it while discussing it.

The main purpose of these sessions is to assist students in their preparation for tut classes. The sessions usually take place on Saturdays 08:00–10:00 and if my grandsons don't play rugby, a session can go on for another 15 minutes. I believe that the students who join these sessions find them helpful because they join them even if the time is changed.

I am glad that I overcame my initial reluctance as I enjoy the continued contact with the students very much.

Publishing student projects on social media *# real-world problems*
[Michael van der Laan (Department of Plant and Soil Sciences)](#)
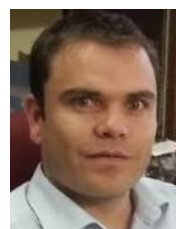
As we enter an age when more people have access to cellphones than basic sanitation, sub-Saharan Africa is the only region in the world where food production per capita is not increasing. Second year students taking the course "Sustainable Crop Production and Agroclimatology" are now engaging in project-based learning (PBL), as they work in groups of three to create a media item (video, podcast, app etc.) aimed at technology transfer to small-scale farmers. The possibility of helping to address real-world problems, even at the second year level, is proving very motivating, as is the ability to work with new technology such as video editing apps. Students are also learning to work collaboratively, to really understand a concept in order to explain it themselves, and are exposed to design thinking methodology (usually associated with engineering), as they come up with fresh ideas and develop new products. This project aims to provide actual support for real life problems.

Staff and teaching assistants are learning just as much, as we collect data on the enhanced learning that is taking place (such as graduate attributes), as well as their perceptions of the project and the group work which will hopefully lead to a journal publication. Greater interaction with students is a huge bonus, although the impact on our time still needs to be better assessed. An action research approach (Plan – Act – Observe – and Reflect) is being used to continually improve on the project brief to students and ways to assess authentically.

Selected projects have or will be published on a Facebook page created by one of the previous student groups, called "[Ingesta: Farming for the Future](#)." And here too fascinating research data is being collected, in the form of reaches, likes and shares broken-down for different times of the day, regions, genders and age groups.

We use two 'How to guides' created by UP colleagues, one on making a [video](#), and another on creating a narrated [PowerPoint](#).

We can also share our experience of getting a lecturer from Drama and Film in to explain the tricks of the trade in film making to our students before they embarked on the project. We will make a video of this presentation in 2018 and share with the faculty.

Feedback with AnswerGarden *# beta phase*
[Rory Biggs (Department of Mathematics and Applied Mathematics)](#)

I like to start my lectures with a (sometimes challenging) question based on the previous lecture; this question is put up on the projector at least five minutes before my lecture starts (lately I also post it on clickUP the day before). I then use [AnswerGarden](#) to collect responses: students can submit (anonymously) any forty-character string. At the start of the lecture, we then look at the "most popular" responses (the more times a string is submitted, the larger it is displayed in the output).

I have been using this system for a little more than a year: I have had students submitting beautiful answers, sending valentines wishes, or simply commiserating about a difficult test. On occasion, nobody gets the solution, highlighting a need to revisit the material (or that the question was too challenging). Overall, I have found [AnswerGarden](#) useful not only for brief feedback but also for giving the students a "voice" in lectures and thereby creating a relaxed and engaged learning environment. I plan to continue using it in my future classes.

It is extremely easy to set up a question on [AnswerGarden](#). I do, however, recommend using a url shortener (along with QR codes) to make the link more accessible.

[HowTo@NAS guide](#)

Course bulletin board using Padlet *# trying out*
[Rory Biggs (Department of Mathematics and Applied Mathematics)](#)

After some mild success using [AnswerGarden](#) in class, I was looking for a way for students and lectures to easily share links, thoughts, questions, etc. I had tried using discussion boards on clickUP for this purpose but it didn't work very well. I vaguely recalled an email Ina Louw had sent the previous year about a new tool she had found which would turn out to suit my goals.
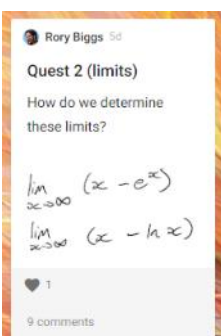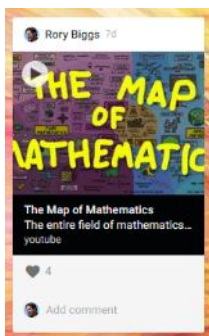

[Padlet](#) is an online platform for virtual "bulletin" boards, where students and lecturers can collaborate and share ideas & links. After setting up a bulletin board, anyone who has the link can add posts (with text, links, pictures, etc.) as well as comment and "like" other posts.

I tried out this platform with our first-year calculus group. (You can view an image of this padlet [here](#).) The student response and engagement was great. I am now using it in a second semester course.

[HowTo@NAS guide](#)

Community-based service learning in geoinformatics *# continuing service*
Victoria Rautenbach (Department of Geography, Geoinformatics & Metereology)

The final-year project module for Geoinformatics (also known as geographic information science or GISc) allow students to complete a project from start to finish in which one or more of the studied techniques of data acquisition and processing are used to produce an output of geographically referenced information. To facilitate this, they rely on a community-based service learning approach in an informal settlement in the east of Mamelodi, City of Tshwane, called Alaska. The students have to map an informal settlement and implement a web solution for a problem they identified, such as assisting emergency services to reach their destinations by mapping the routes in the Alaska community.

Realities of Alaska

You can have a look at the students' blogs, a short summary video of the module, examples of GMT320 projects, and a student wiki page (this is the wiki the students contribute to and I maintain—some maintenance still needed after S1).

Some of the data in the wiki

Invitation to contribute *# dare to share*
Ina Louw (Department of Education Innovation)

Do you have a new teaching innovation you are trying out? Have you been doing something tried and tested for years to engage with students? Has some issue been on your mind of late? Perhaps you have found a way to streamline some aspect of your course saving you valuable time? Please share your thoughts with the Fly@NAS teaching and learning community through this bulletin.

Kindly keep the style of this bulletin (and intended audience) in mind, aiming for a short piece (no more than half a page). Include the following: (1) Your name (along with a link to your personal page or departmental page featuring you). (2) Your department. (3) A picture of yourself. (4) An image to be included in your piece, if appropriate. (5) Links to any webpages or tools you refer to in your piece. (5) A HowTo@NAS guide if appropriate (click here for an example). (6) A category or tag for your piece, e.g., # trying out, # beta phase, # tried and tested, # food for thought, # streamlined, # follow up. More details to your piece can always be included via a link (like this). Submissions can be emailed to me (ina.louw@up.ac.za); your piece will be (lightly) edited for inclusion in the next bulletin.

General queries or comments regarding this bulletin can also be directed to me. Technical queries or questions regarding formatting, file formats, links, etc. can be directed to Rory Biggs (rory.biggs@up.ac.za). All bulletins will be archived here, on the NAS faculty website, and on the Fly@NAS clickUP site.