Group Reports                                                                      Reports

2021-01-13

# Reports from Academic Staff in the College of Sciences and Health on the Adaptations Made to Teaching, Learning and Assessment During the Covid-19 Situation from March 2020 to January 2021 [Document , Presentations and Recording

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# Reports from Academic Staff in the College of Sciences and Health on the adaptations made to Teaching, Learning and Assessment since March 2020

January 2021

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# Introduction

Staff in the College of Sciences and Health have made substantial changes to their approaches to learning, teaching and assessment in the period since March 2020. In order to highlight the work undertaken by staff and to share their experience, staff were invited to submit a brief summary on some aspect of how they have adapted their teaching, learning and assessment practice e.g. by using a new technology, by using a new method, by doing something differently. Submissions were invited from academic staff individually or in groups and multiple submissions were permitted.

The submissions are all included in this document which will be made available to staff in the College of Sciences and Health. Staff may then follow up with the various authors of the submissions, using the contact details included in the document.

In addition, a special open meeting of Academic Board for the College of Sciences and Health will be held on Wednesday, 13th January from 10am to 12noon. All staff in the College are invited to attend and all staff who have made submissions are invited to speak about their submission.

The submissions are categorised as follows:

**Demonstrations**: These are submissions relating to the use of specific technologies. Authors of these submissions have been allocated a time slot of 3-4 minutes at the Academic Board meeting, during which they will share their screen and demonstrate their use of software. 10 such demonstrations are scheduled for the Academic Board meeting.

**Presentations**: These were submissions relating to more general changes in teaching and learning. Authors of these submissions have been allocated a time slot of 1-2 minutes at the Academic Board meeting, during which they will speak about their submission with the option of using a single PowerPoint slide. 24 such presentations are scheduled for the Academic Board meeting.

**Documented**: Three additional submissions have been included in this document, also relating to general changes in teaching and learning.

## Academic Board Meeting Schedule – Demonstrations (3-4 Minutes Each)

| Time | Minutes | Type | Speaker(s) | Demonstration Topic |
|------|---------|------|------------|---------------------|
| 10:00am | 5 | Introduction | Prof Michael Devereux | |
| 10:05am | 4 | Demonstration | Natalie Hopkins | Screencast-o-matic |
| 10:09am | 4 | Demonstration | Damian Gordon | Bongo |
| 10:13am | 4 | Demonstration | Orla Howe | MS Lens |
| 10:17am | 5 | Questions and Answers | | |
| 10:22am | 4 | Demonstration | Graham O'Neill, Julie Dunne | Kahoot |
| 10:26am | 4 | Demonstration | Mairead Stack | Brightspace Rubrics |
| 10:30am | 4 | Demonstration | Siobhan Daly | Remote Lab Exercises |
| 10:34am | 5 | Questions and Answers | | |
| 10:39am | 4 | Demonstration | Brian Gillespie | Interactive Programming |
| 10:43am | 4 | Demonstration | Karen Cunningham | Online Clinical Logbook |
| 10:47am | 4 | Demonstration | Greg Byrne | Assessment Calendar |
| 10:51am | 4 | Demonstration | Sarah Rawe | OneNote |
| 10:55am | 5 | Questions and Answers | | |

## Academic Board Meeting Schedule – Presentations (1-2 Minutes Each)

| Time | Minutes | Type | Speaker(s) |
|------|---------|------|------------|
| 11:00am | 2 | Presentation | Timothy Hogan |
| 11:02am | 2 | Presentation | Aaron Mac Raighne |
| 11:04am | 2 | Presentation | Sara Boyd |
| 11:06am | 2 | Presentation | Brian Keegan |
| 11:08am | 2 | Presentation | Therese Murphy |
| 11:10am | 2 | Presentation | Steve Meaney and Kathleen Brosnan |
| 11:12am | 5 | Questions and Answers | |
| 11:17am | 2 | Presentation | Christine O'Connor and Gemma Kinsella |
| 11:19am | 2 | Presentation | Fabian McGrath |
| 11:21am | 2 | Presentation | Seana Hogan, Tao Zhang, Gemma Kinsella |
| 11:23am | 2 | Presentation | Greg Byrne and Sara Lynch |
| 11:25am | 2 | Presentation | John Butler and Fiona Murray |
| 11:27am | 2 | Presentation | John Gilligan and Marie Glynn |
| 11:29am | 5 | Questions and Answers | |
| 11:34am | 2 | Presentation | Kathy Young and Sara Boyd |
| 11:36am | 2 | Presentation | Steve Meaney |
| 11:38am | 2 | Presentation | Leanne Harris |
| 11:40am | 2 | Presentation | Michael Collins |
| 11:42am | 2 | Presentation | Natalie Hopkins and Mairead Stack |
| 11:44am | 2 | Presentation | Oscar Mac Ananey, Natalie Hopkins, Mairead Stack |
| 11:46am | 5 | Questions and Answers | |
| 11:51am | 2 | Presentation | Patrice Behan and Eoin McGillicuddy |
| 11:53am | 2 | Presentation | Siobhan Daly |
| 11:55am | 2 | Presentation | Steve Meaney |
| 11:57am | 2 | Presentation | Tao Zhang, Gemma Kinsella, Seana Hogan |
| 11:59am | 2 | Presentation | Sarah Rawe and Claire McDonnell |
| 12:01pm | 2 | Presentation | Sara Boyd |
| 12:03pm | 5 | Questions and Answers | |

# Demonstrations

## Natalie Hopkins (To include demo of Screencast-o-matic)

For further questions or feedback, the speaker can be contacted at natalie.hopkins@tudublin.ie.

**Use of Screencast-o-matic to assist delivery of laboratory and tutorial programmes.**

With a move to fully online laboratory sessions for some of my modules, screencast-o-matic was used to record material for delivery. This software allows recording of the activities being carried out by the lecturer on their laptop. The videos generated can be also easily edited to highlight important aspects.

In Control and Integrative physiology, delivered to 5 degree programmes, virtual online labs were assisted with recordings of **how to make graphs** using Microsoft excel and **how to analyse data.**

In Anatomy and Physiology which is delivered to BSc Biosciences, the histology component of the module was assisted by recordings of the lecturer viewing various histological specimens and demonstrating key structures. This was **in place of lab based microscope work** which could not take place.

In Medical physiology delivered to 3 degree programmes, this software was used to assist students in **how to perform online searches and cite** correctly for project work.

For all the modules where this was used, it **enhanced the experience of the student** and also **helped students** who were not in direct communication with their classmates, to **navigate** through difficult aspects of these modules. It also ensured delivery of aspects of the course impacted by reduced face to face teaching.

## Damian Gordon (To include demo of Bongo)

For further questions or feedback, the speaker can be contacted at damian.x.gordon@tudublin.ie.

The COVID pandemic meant that the Computer Science students' Final Year project presentation process had to change, and since we weren't able to do face-to-face presentations we looked at a range of alternative technologies as an adequate substitute system. Eventually we concluded that Brightspace provides all of the features that we required to complete these presentations. The sessions worked as follows, all of the supervisors were added to the Final-Year-Project module in Brightspace, then the session chairs created a new classroom in Bongo per student, and invited only that student to the session (to prevent Zoombombing). The students' presentations were recorded, and after the students completed the session the lecturers discussed the performance of each student, ensuring that the student had left the room and the session was no longer being recorded. To explain the process to the students and lecturers, a series of webpages with videos were created, with specific notes on how to overcome commonly occurring problems.

For 112 students this process worked well; there were 4 students who had problems with the webcams, and 2 students with issues with audio, and those presentations were re-presented in subsequent weeks when students were able to borrow other people's laptops.

## Orla Howe (To include demo of MS Lens)

For further questions or feedback, the speaker can be contacted at orla.howe@tudublin.ie.

DT259-3 (TU751) was one of the few award year groups from the School of Biological and Health Sciences to conduct online examinations early in the Pandemic in May 2020. It was the responsibility of the programme team to explore all potential online assessment methods through Brightspace for this group while considering the fact that some students had reported poor internet connectivity issues. Therefore 2-3 hour examinations requiring full internet connectivity for that duration appeared to be problematic, and alternative backup methods incorporating mobile phone signals were investigated.

A pilot study accompanied by virtual information sessions and the creation of student friendly guidelines to use the **MS Office Lens phone application** was carried out for the **stage 3 award year students in March-April 2020.** There was 100% participation in the pilot study by the class and this method was therefore adopted for several stage 3 modules during the examination period. Lessons were learned from the initial pilot study along with both the modular and supplemental examinations 2020 which were shared with the school of Biological and Health Sciences in preparation for the 2020-2021 semester 1 examination period. The MS Office Lens guidelines were subsequently shared with the school and incorporated into student examination guidelines across all modules and programmes for 2020-2021 semester 1 examinations.

## Graham O'Neill and Julie Dunne (To include demo of Kahoot)

For further questions or feedback, the speakers can be contacted at graham.oneill@tudublin.ie and julie.dunne@tudublin.ie.

Kahoot quiz's - a tool to enable formative self-assessment and peer to peer interaction in remote learners.

Over the course of the semester, third year Chemistry students participated in an 8 question quiz every second week at the start of lectures. The quiz was facilitated through Bongo, the lecturer shared their screen which displayed the quiz questions via the Kahoot webpage. In a second browser window or via their mobile phone, students logged into the quiz, this became the students answer pad. The question appeared on screen, followed shortly by up to 4 possible answers, students selected a, b, c or d on their answer pad to submit their answers. Marks were awarded for (i) correct answers (ii) speed at which the answer was submitted and (iii) a streak of correct answers. After each question a mini leader board is displayed showing the top 5 students, who often received congratulations from their peers.

The use of Kahoot in this manner has several advantages including;

(i)   Promotes student engagement and interaction.
(ii)  Enables bi-weekly student self-assessment of their knowledge.
(iii) Students receive instant feedback regarding the number of questions correct.
(iv)  No marking required by the lecturer.
(v)   High level of adaptability (e.g. question type, duration of answer period, multi-select answers).
(vi)  Lecturers can access the quiz data to assess results. This can allow the lecturer to identify if the class found a particular topic difficult or if specific students are not keeping up with module topics.

The quiz data can be exported to excel and graphed automatically (template can be shared) to produce the below graph to show class average per quiz as well as the breakdown of marks in each quiz.
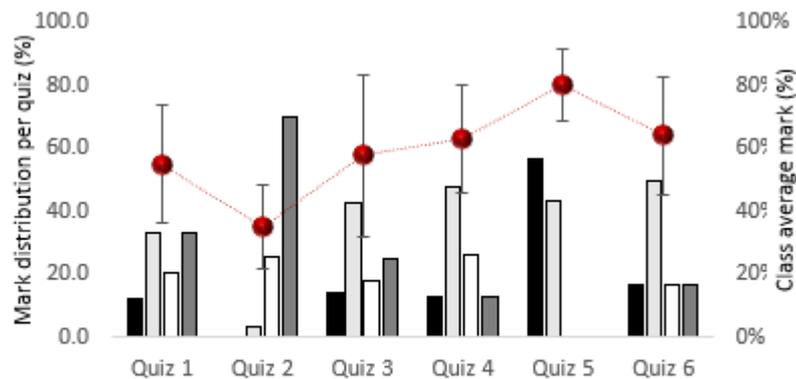


Figure 1: Class average mark per quiz (●) and mark distribution for each quiz 80-100% (■), 60-79% (□), 50-59% (□) and below 50% (■).

## Mairead Stack (To include demo of Brightspace Rubrics)

For further questions or feedback, the speaker can be contacted at mairead.stack@tudublin.ie.

During 2019 - 2020, as CoSH teaching champion, I have provided support to individual staff and programme teams to develop Rubrics that provide good rational for marking, are reusable, adaptable and that enhance students' feedback literacy.

Within a CoSH Brightspace module the theory and good practice of developing 'Criterion Based' and 'Holistic' Rubrics is presented in a workshop recording and examples of both subject specific Rubrics and generic Rubrics are shared.

In my presentation I will briefly outline the structure, application, and value of 'Criterion Based' and 'Holistic' Rubrics and outline how Rubrics are used in Brightspace to speed up the grading process, to maximise the value of the VLE and at the same time develop quality reusable feedback resources.

## Siobhan Daly (To include demo of Remote Lab Exercises)

For further questions or feedback, the speaker can be contacted at siobhan.daly@tudublin.ie.

Effective laboratory based exercises in physics enable learners to fully understand the concepts introduced in the lecture environment but also embeds and enhances important skills including measurement techniques, the confident use of instrumentation, data gathering, data analysis, understanding uncertainties and how they propagate, report writing and presentation.

Providing this experience in a college-based laboratory environment became impossible for us to provide to some cohorts of students. The year 1 physics laboratory team developed a full suite of remote laboratory exercises that students could undertake using equipment found at home, simulations, mobile phones and scenarios. Virtual experiments were designed to be hands on, engaging and designed to meet the required learning outcomes. This presentation will focus on the key aspects of success of the year 1 virtual physics laboratory programme and its roll out in semester 1.

## Brian Gillespie (To include demo of Interactive Programming)

For further questions or feedback, the speaker can be contacted at brian.x.gillespie@tudublin.ie.

I found my previous experience leading the Blended Learning initiatives at the School really helped to understand the benefits and limitations of online teaching. My responses are summarised under the following headings:

- Timetabled teaching: Adopted a more interactive delivery approach for online teaching sessions (using Bongo and Teams) by deemphasising the more traditional slides-based delivery in favour of theory explanations and illustrations using live worked examples (where appropriate). This allowed a for more measured delivery, facilitated comprehension checkpoints and student feedback and better linked the theory and practice.
- Technology tools: Used a mixture of screen-sharing tools, screen and video capture, interactive whiteboards and cloud-hosted collaboration tools. This helped the students to organise their learning, find information quickly and get help from me and each other. Great use of MS Teams chat for communications with groups and individuals.
- Technology access: Mindful of the wide variation in broadband access, different operating systems and personal computer capabilities, I try to leverage to cloud services (man of which are free for educational use under HEA agreements) over locally installed applications and web-based tools. Also make material available for download offline outside class hours
- Multimedia: The use of video explainers (created by me or others) and interactive quizzes. Theoretical content lectures are often better delivered this way to free up online class time for a more interactive experience
- Summative assessment: Open book exam and project work formed the mainstay of the updated assessment approach. The challenge with open book exams to access the students in such a way that it would not be trivial to use the web or notes to respond. This led to a more probative approach requiring genuine insight and problem-solving capabilities on the student side
- Formative assessment: Using weekly quizzes, in-class challenges, and student-led work-though solutions to challenges online. A great way to gauge how students are doing and allows for adjustments in content and pace
- Giving feedback: Providing annotated solutions to assessments and offering general commentary on student submissions, used email and Teams chat.
- Seeking feedback: Introduced the discipline of pausing regularly during online lectures to illicit feedback or take questions. Use of quick surveys on Teams (vote up or down) very useful
- Support labs: Targeting new students in year one particularly, held week support labs online to help with programming problems and assisting with the technology stack in general. Held several all-hands with students at the beginning of the term to welcome them back and provide explainers about course-related matters

In summary, I would have to say that being forced to teach online since March has really acted as an incentive to improve my teaching methods to deal with the challenging circumstances. Even when things return to a new normal, I still expect to use many of the new ideas, particularly in communications and assessment that I believe have been very successful in 2020.

## Karen Cunningham (To include demo of Online Clinical Logbook)

> For further questions or feedback, the speaker can be contacted at
> karen.cunningham@tudublin.ie.

TEACHING-Recorded online demonstrations for clinical practice.

Recorded the lectures so students can relisten when they are out on placement in order to link academic learning with clinical practical.

Encourage students to share experiences with peer during online tutorials about their Covid and placement experience.

Enhanced student engagement during teaching sessions with, breakout rooms and relevant group topics for discussion.

Also, Clinical paper reviews for focus and engagement.

ASSESSMENTS-Incorporated online viva for practical assessments in response to restrictions and infection control measures.

More Online Quizzes for all years to encourage engagement in all content areas of the module.

Practical assessment was revised in order to comply with Covid-19 guidelines.

Restructure papers to reflect open book exam –questions focus more on clinical case scenarios and interpretation of clinical data.

LOGBOOK-Online weekly logbooks with analysis of clinical to keep students engaged and monitor progress when out on hospital place.

Liaised with practiced educators to adjust training manuals in accordance with infection control guidelines for clinical practice during Covid-19.

Revised training manuals to reflect Covid infection guidelines and to reflect clinical practice during Covid. (Reference to international guidelines reflecting best practice).

TUTORIALS- increase in virtual contact tutorial time to engage with students more while out in clinical placement.

Increased contact time with practice educators via weekly emails and telephone calls to support and maintain good communication throughout Covid-19, also to inform clinical tutors about any relevant changes occurring clinically.

Presentations have been moved online for students in order to comply with infection control.

More clinical placement centres have been sourced with online TEAMS meeting to bring new centres up to date with new changes.

Liaised with Library to purchase online clinical textbooks for students to access.

## Greg Byrne (To include demo of Assessment Calendar)

For further questions or feedback, the speaker can be contacted at greg.byrne@tudublin.ie.

The process of coordinating assessments for students is a recognised example of best practice but is an onerous task carried out by year coordinators in most programmes. It involves communication with all teaching staff on a programme, often including staff members from other Schools. Year coordinators have no set template for producing the calendar and, even when the task is complete, dates, times and locations can change leading to confusion. For academic staff setting assessments, it can be difficult to know whether your class has other assessments around the same time and what form most of their assessments take.

As a Teaching Champion in 2019-20 I worked with programme teams to encourage the use of an assessment calendar I have created in Excel on OneDrive. It is a collaborative way for staff to set their assessment times, is easily edited, and is available for students to view at any time. Students see the date, time, location, weighting, and type of assessment. The competition for assessment dates encourages staff to enter the information as early as possible and discourages the close grouping of assessments. The calendar can be saved as a bookmark or shared as a link so there are multiple ways to access it on any device.

## Sarah Rawe (To include demo of OneNote)

For further questions or feedback, the speaker can be contacted at sarah.rawe@tudublin.ie.

Using OneNote as a Digital Laboratory Notebook in First Year Undergraduate Chemistry Laboratory Practicals

Paper-based workbooks were a feature of our first-year laboratory teaching but were not practical given current restrictions and a replacement was required. While digital laboratory notebooks are rapidly replacing paper-based equivalents in industry, software is prohibitively expensive. Therefore, an affordable alternative was needed. OneNote (MS Office 365) provides numerous functionalities and can be employed as a DLN in the teaching laboratory via the Class Notebook app.

Our paper-based workbook was adapted for OneNote. Each first-year laboratory group was given access to their Class Notebook via a link on Brightspace. Each Class Notebook was organised into sections – a content area, teacher area, and an individual student notebook (accessible only to the student concerned and the supervisor / demonstrator). Each individual notebook contained editable worksheets distributed on a weekly basis.

During the practical, students used the online OneNote app on their personal devices. They were advised how to protect their devices for the duration of the lab. During the practical session, students entered data and carried out calculations directly into their editable worksheets which, once synced, could be accessed on their desktops at home for follow-up work. Once worksheets were complete, supervisors would then mark and return feedback via the Class Notebook.

# Presentations

## Timothy Hogan

For further questions or feedback, the speaker can be contacted at timothy.hogan@tudublin.ie.

I have been teaching Numerical Methods for a number of years, and I am particularly passionate about it. I encourage students to look on the subject as more than a standalone module. This is material that they can build on through their entire degrees. There is a vibrant online community, with a vast amount of free open source material available to enrich their studies and their academic progress.

The teaching of this particular topic pre-March 2020 was constrained by the number of computers available in a Lab, and whether the required software was installed. Since remote teaching began I have been using Microsoft Teams with full synchronised lectures. Following student feedback, I have also offered 'breakout meetings' - individual 5/10 minute sessions.

There are many advantages to this new format

- Group numbers are not limited by the physical limitations of a classroom.
- Students are not working on unfamiliar computers, so we are not wasting class time on hardware issues.

The key restraint is the difficulty of getting real-time student feedback. It is easier to get a sense of class progress in a classroom. This is why I started offering 'breakout meetings'. As a general observation the quality of material submitted has been better and the level of motivation for some students is a lot higher.

## Aaron Mac Raighne

For further questions or feedback, the speaker can be contacted at aaron.macraighne@tudublin.ie.

The below relates to a final year module, the only module I teach in semester 1 for which I am solely responsible.

The assessment has changed from end of module exam to a 50:50 split between CA and exam.

I have replaced live lectures with a ratio of 3:1 asynchronous and synchronous sessions. The asynchronous sessions contain video lectures in which all content is delivered. Along with these lectures are matching quizzes, which the students have a minimum of two weeks to complete. These are used as a study guide and were designed to help keep students engaged with the material.

The synchronous session is used as a tutorial. The students upload questions to a shared spreadsheet and these are then covered in class. All of the questions asked came directly from the quizzes. I addition to these quizzes the CA includes two 1-hour long Brightspace quizzes.

It was a massive undertaking and a huge amount of work to setup. The students seemed to put a lot of work into the quizzes and it would seem engagement was higher across the full class than any previous year. Feedback from students has been requested on multiple occasions but a very small amount has come back so it is difficult to know what the student experience of this module was.

## Sara Boyd

For further questions or feedback, the speaker can be contacted at sara.boyd@tudublin.ie.

Students from TU869 must complete a 7-month period of professional placement during their 3rd year.  Half of this placement is spent within the private sector specifically getting experience of regulatory compliance in the areas of food safety, environmental management and protection, health and safety and the built environment.  In 2020 all students successfully completed this period within the private sector.  Students are required to spend the remaining time in the Health Service Executive in Environmental Health Departments shadowing EHOs and working as part of the EH team.  Due to COVID this was not possible in 2020.  In response to this a new EH Placement Model was devised specifically for the HSE placement component.  The TU869 Programme Chair in conjunction with the Environmental Health CPD & Research Unit, developed an EH Student Seminar Professional Placement Seminar Series.  A total of 18 seminars were delivered by EH experts from the Environmental Health Operational Units within the HSE and addressed all 5 of the EH core areas.  These seminars were all case study based with a PBL approach which required pre-reading, pre-viewing, completion of PBL tasks, legal interpretation with discussion and engagement on the day.  We also replicated the student mentoring system using an online platform.  This weekly online engagement between the EH student and EHO facilitated the natural conversation and educational engagement that would have occurred in the office placement environment.  Mock food safety inspections will also be conducted and led by EHOs.  These mock inspections will follow the HSE inspection protocols, legal enforcement, information gathering, risk-based decision-making measuring regulatory compliance.  These mock food safety inspections will develop the student's regulatory enforcement and auditing skills along with production of outcome reports.  The EH student placement was also enhanced by online learning using relevant EH resources for example World Health Organisation, Food Safety Authority of Ireland, European Food Safety Agency, Environmental Protection Agency and Health and Safety Authority of Ireland to name but a few.  There was no change to the assessment format of the EH Student Placement.

## Brian Keegan

For further questions or feedback, the speaker can be contacted at brian.x.keegan@tudublin.ie.

One of the first steps the school put in place was academic leadership team to develop the assessment strategies. This was made up of the Senior lecturer team and was crucial in providing guidance to the school staff on best practice and for a consistent approach for students.

Support labs were resourced which focused on the core module of programming. This provided drop-in remote sessions for students who were finding the module challenging.

School technicians provided a standard virtual lab image to reduce troubleshooting issues and provide students (and staff) with a common platform.

Staff were allowed the flexibility of delivery using a combination of pre-recorded lecture sessions, lab pre-amble and live lectures. Online labs were well resourced to deal with student queries.

Staff were provided with guidance including video demonstrations on how to facilitate online labs to ensure privacy of student work.

Forums were used to facilitate student interaction and to provide out of hours support to student queries.

Simulation software was used were possible to replace hardware interactions (E.g. TinkerCad, Packet Tracer).

The school extended the use of physical equipment to visually impaired students upon request.

## Therese Murphy

For further questions or feedback, the speaker can be contacted at therese.murphy@tudublin.ie.

A key challenge for students and lecturers this year is facilitation of group learning activities and social interaction with fellow students. This is especially important for current 1st year student who have been particularly impacted by the ongoing pandemic. To address the challenge of facilitating group learning activities and group assignments I used the group video assignment tool in Brightspace to facilitate group project collaboration in first-year and second year Professional skills modules.

Video assignments allow students to use the Virtual Classrooms in Bongo to create a virtual classroom session or set up video meetings with other learners and collaborate on group projects. You can also use the Video assignment tool to create recorded presentations remotely, collaborate on written reports and/or video assignments. Furthermore, assessments can be linked to the group video assignments allowing groups to formally submit their projects for marking. Group projects can be marked by the lecturer and that mark is then automatically populated for all member of the group – a useful tool for lecturers reducing time associated with group project marking and population of grades.

Feedback from students was very positive and they agreed that it allowed for more social and professional interaction with fellow students and that group video assignments helped facilitate learning and collaboration on group projects.

## Steve Meaney and Kathleen Brosnan

For further questions or feedback, the speakers can be contacted at steve.meaney@tudublin.ie and kathleen.brosnan@tudublin.ie.

First year students enrolled on the BSc (Hons) in Biomedical Science and the BSc (Hons) Biomedical and Molecular Diagnostics (> 80 students) must take a module in Professional and Scientific Skills. One of the key learning outcomes of the module relate to competence in communication and teamwork, both of which are challenging to attain in the current environment. A team oral presentation is a core part of the modular assessment. The Virtual Classroom function of BrightSpace was used to host and deliver team-presentations, with students coordinating their groups remotely. To support this mode of delivery, a number of online workshops and tailored Screencasts, with a focus on the design of material for online presentation, were delivered. A session on practical tips for online team-delivery were also provided. The presentation order was randomised, ensuring that all students were required to attend each presentation. During the presentation sessions the Virtual Classroom provided a good opportunity to quiz and interact with the students, largely preserving this aspect of the on-site presentations. However, it did not capture the dynamism and atmosphere of a live, face-to-face session, a limitation of the approach. When using such alternate methods of assessment, it is important to provide students with additional tailored skills to support their ability to succeed in such alternate assessments.

### Christine O'Connor and Gemma Kinsella

> For further questions or feedback, the speakers can be contacted at
> christine.oconnor@tudublin.ie and gemma.kinsella@tudublin.ie.

TFEL4003 Drug Delivery and Targeted Therapy is an optional module (100% c/a) taken by 4th year students in the School of Food Science and Environmental Health. While online activities were an integral component of the module previously, this year we worked with all students and stakeholders who input on the module to retain all aspects of the module in an online format. We also broadened the audience for our events by inviting other programmes and schools across the College of Sciences and Health to our workshop and guest lecturer events.

A blended delivery approach included:

- Student development of an ePortfolio to house their professional development.
- Synchronous lectures and associated asynchronous online activities to maintain engagement throughout
- Group research and presentation through Bongo; Peer feedback incorporated
- Individual research on a recent research article

Furthermore, the students reflected on a series of events all of which were delivered virtually including:

- Guest speakers on gene therapy and targeted cancer research from (TU Dublin and RCSI
- Patent attorney guest speaker from Purdue Lucey
- A half day Pfizer workshop given by senior scientists. This gave a snapshot of different roles across the Grange Castle site along with the graduate programme.

### Fabian McGrath

> For further questions or feedback, the speaker can be contacted at fabian.mcgrath@tudublin.ie.

I have incorporated the Learning Science Teaching and instructional animations series into my Introduction to Biomedical Science Year 1 module for TU866/867. I can attribute 10% of the Practical CA mark for the module to the completion of these stepwise learning animations by students in Brightspace. Also greater use of web links and videos in general. Much more content.

### Seana Hogan, Tao Zhang, Gemma Kinsella

> For further questions or feedback, the speakers can be contacted at seana.hogan@tudublin.ie,
> tao.zhang@tudublin.ie and gemma.kinsella@tudublin.ie.

The goals of adapting the following approaches were to increase programme engagement with the students with their pharmacy practice module through this challenging Semester (2020-2021) and continue enhancing students' future employability.

1. Pre-prepare prescriptions before dispensing – students were issued prescriptions prior to attending face to face sessions. Completion of a dispensing lab report identifying key aspects of the medication and potential counselling advice allowed for extra time to engage with dispensing specific software once on site and keep within the required timeframe.
2. Product investigation group work – students were randomly assigned to groups and asked to investigate and compare various vitamins. Previously they would have been asked to go into

chemists and look at the products noting ingredients, labels, prices and product information. This year they were asked to use manufacturers' websites to review this information and identify various different marketing and advertising techniques used to promote each product.

## Greg Byrne and Sara Lynch

For further questions or feedback, the speakers can be contacted at greg.byrne@tudublin.ie and sara.lynch@tudublin.ie.

The module BIOL2502 (Molecular Immunology) is taught to second year students in TU867 and TU866. It includes a significant amount of laboratory contact which was adversely affected by the ongoing pandemic. Our usual lab time was cut in half which made the achievement of the relevant learning outcomes challenging. In order to supplement the in-person teaching, we designed a series of practical webinars or "virtual labs" where the relevant content could be covered. This included the use of online resources to simulate microscopy in order to examine blood smears, carry out differential counts, and examine tissues of the immune system. As a result, we could focus our precious in-person contact hours on skills-based laboratory techniques.

## John Butler and Fiona Murray

For further questions or feedback, the speakers can be contacted at john.s.butler@tudublin.ie and fiona.murray@tudublin.ie.

A flipped classroom was used to support online learning in the module Introduction to Probability and Statistical Inference. The module had over 50 part-time Springboard students from two cohorts the Data Analytics for Professionals and Applied Statistics.

To facilitate the flipped classroom, the 3-hour evening lecture was divided into three parts.

The first was a house-keeping class to discuss the broad concepts that the students would see in the pre-recorded videos and their next problem sheet.  It also allowed for informal discussion about the module.

The second part was a tutorial style session.  Solutions to the weekly problem sheets were worked through.  Prior to the lecture the solutions submitted by students were looked at to identify which questions to focus on.

In the third part, students watched pre-recorded lectures. A total of 25 subtitled videos between 10-25 minutes in length were provided. On average, the videos were watched 97.8 times meaning each video was watched twice.

In addition, a twitter account was setup to give insight into real world application of statistical and machine learning methods.

Overall, the student engagement and feedback were very positive, and they appreciated the benefits of a flipped classroom.

## John Gilligan and Marie Glynn

For further questions or feedback, the speakers can be contacted at john.gilligan@tudublin.ie and marie.glynn@hpo.ie.

The DT6010 CPD certificate in Clinical Coding (Ire) is a Level 6 10 ECTS Continuing Professional Development Certificate course. It is run by the Hospital In-Patient Enquiry (HIPE) Team of the Healthcare Pricing Office of the HSE. Certification is provided by TUDublin through the School of Computer Science , City Campus .

HIPE collects demographic, clinical and administrative data on discharges from, and deaths in, acute public hospitals nationally. The current classification used for all discharges from 1st January 2020 is ICD-10-AM/ACHI/ACS 10th edition

The onset of COVID-19 created many challenges for students. Their participation was affected by: changes to work arrangements, personal or family illness  family commitments; study facilities  and limited access to technology.

To address these challenges our team explored options to deliver the education programme in an efficient, flexible, supportive and timely manner.  Changes to programme delivery were introduced through engagement with the university and on-going direct communication with students. Organizational changes with respect of technology use were adopted.

Even with all these rapid changes the high overall pass rates on this course were maintained, demonstrating that the steps taken to support students through technology use, and an increase in online training, were successful.

## Kathy Young and Sara Boyd

For further questions or feedback, the speakers can be contacted at kathy.young@tudublin.ie and sara.boyd@tudublin.ie.

Building Personal Experience and Reflection into assignments aims to be a submission by students which attempts to avoid plagiarism in the on- line forum as each submission is an individual response by student's reflection on their professional placement experience and personal preferences. Students are asked to select one seminar from a series of eight presented by TU Dublin-HSE to final year students and answer a number of questions including challenges while on placement along with which EH lead function they would like to be a part of and why..

## Steve Meaney

For further questions or feedback, the speaker can be contacted at steve.meaney@tudublin.ie.

The final year of the BSc (Ord) in Biosciences includes a capstone module designed to provide the students with an authentic experience of research including a literature review, a data analysis task and a conference poster presentation. Normally the poster presentation takes place in the context of the school research day, which provides an opportunity for students to present in a real conference environment and to engage with other BSc (Hons) research projects. To retain as much of this experience as possible, a virtual session was developed in BrightSpace, using ten simultaneous virtual presentation rooms each with a unique address provided via an interactive

'access sheet'. Students were then able to present their poster and engage in discussion. A general lobby area was also provided, but participation in this area was limited. Feedback was generally positive with some staff commenting that the format permitted more focused and less hurried discussion than in the bustle of a real conference setting. A deficit was the difficulty in providing a poster gallery for attendees, something that is available via bespoke conference software. The solution used, however, was free of additional capital investment and used existing features of BrightSpace. This approach would be suitable for 'conference style' settings and the approach will be expanded on for 2021.

## Leanne Harris

For further questions or feedback, the speaker can be contacted at leanne.harris@tudublin.ie.

*Kahoot* quizzes were incorporated into synchronous (live) virtual lectures with Stage 1 TU751/755/754/762 students. Their purpose was to enhance engagement with large online classes. *Kahoot* is a free, easy-to-use, smartphone-based response system with very effective visuals and sound effects. *Kahoot* can be implemented into any lecture session through a simple screen-share via Bongo in Brightspace. Students login, select their answer using their phone, and will see the correct answer to the question once the allotted time has run out. Sample student feedback includes: '*that was great fun', 'that was brilliant'. Kahoot* – A competitive game-based learning platform that encourages fun and engaged learning!

*Video Notes* is an application that is available as part of the announcement tool in Brightspace. This tool was implemented in a number of modules in the Biosciences programme (TU751). It allows students to see and hear their lecturer in addition to reading text announcements. *Video Notes* facilitates a more personal approach to module interactions by using short videos to communicate notifications e.g. timetable updates, assessments to be completed, the release of grades etc... In the current online teaching environment, *Video Notes* is an effective tool that encourages student engagement with module content where face-to-face contact is limited.

## Michael Collins

For further questions or feedback, the speaker can be contacted at michael.collins@tudublin.ie.

As Lecturer for Programming in all full-time undergraduate programmes in the School of Computer Science, moving to full online teaching facilitated the introduction of specialised support labs to assist year 1 and 2 students to achieve the skills and key learning objectives. These labs were resourced by staff with strong programming backgrounds and were timetabled every Mon – Fri, 5pm – 6pm. Students would make an appointment to meet a staff member online where they could receive one-to-one assistance with their programming. There was good engagement by students with these support labs and feedback by all stakeholders has been very positive.

Another change introduced in the School is with study exchange opportunities. The School of Computer Science offers students in year 3 of their Bachelor programme the opportunity to participate in a foreign study exchange with a number of our university partners. Due to the pandemic this year, many of these students cannot participate in an exchange for health and safety reasons. One of our German partners, Ostbayerische Technische Hochschule (OTH) Regensburg, kindly invited the School to nominate any of our year 3 students to participate in a **virtual** exchange in semester 2 (2020/21). This would facilitate an international exposure at a foreign university to students without the current travel health risks.

The virtual exchange would facilitate our students to take a mixture of modules delivered here in the School and from OTH with the expectation they would achieve the minimum ECTS required to be considered for progression into their final year. This delivery model is not completely new to the School as previous students that have spent semester 2 abroad on study exchange have taken our unique "Global Classroom" module, which is delivered completely online and worth 10 ECTS. This module combined with the credits obtained from their host university would enable the student to meet the minimum credit requirements for the semester. However, in this new arrangement, the students will remain at home and be allowed to take **any mixture** of modules between the School and OTH.

## Natalie Hopkins and Mairead Stack

For further questions or feedback, the speakers can be contacted at natalie.hopkins@tudublin.ie and mairead.stack@tudublin.ie.

**Development of a suit of online tutorials in BIOL2803:**

The module is delivered to 2nd year students on three degree programmes. The tutorial component is usually delivered face to face. In response to Covid-19, this was **changed to virtual online**. It is traditionally delivered to reinforce topics covered within lectures in the module. This term, recordings of all lectures were made available for review after class. This allowed more scope within the tutorial programme to **facilitate and expand additional learning.**

During the tutorial sessions students were given access to recorded Bongo sessions to view and assimilate accompanied by YouTube videos and TED talks. Synchronous drop in sessions took place to consolidate learning.

The programme allowed students to:

**Review** more complex material covered in lectures.

**Expand** on topics covered, incorporating recent research carried out in these disease areas.

**Exposure** to talks delivered by experts in the fields of Immunology, followed by **discussion.**

**Receive guidance** on project work.

Drop in **feedback** sessions for project work to **monitor** progress throughout and address difficulties.

There was excellent engagement with the tutorial programme. Students demonstrated a more research led knowledge than would usually be seen from second year students.

## Oscar Mac Ananey, Natalie Hopkins, Mairead Stack

For further questions or feedback, the speakers can be contacted at

The laboratory component of BIOL 2804 (Control and Integrative Physiology) is designed to allow students to build their understanding of how the body responds to metabolic stress through carrying out a group project.  As no data collection could take place this was changed to data analysis.

Over 4 workshops the students were given progressively larger sets of data (as recorded by previous year groups) and were guided through the process of scientific writing.  At each workshop feedback was given and expectations presented.

**Workshop 1** – Data from a single physiological system was provided.   Instruction was given on how to write a  Methods Section and on the use of excel to transform data into results.  An individual assignment was set to demonstrate proficiency with excel.

**Workshop 2** – Data from 3 physiological systems was provided.  Instruction was given on how to write a Results section.  A group assignment was set to demonstrate correct notation for Figures and Tables.

**Workshop 3** -  A compete set of data was provided.  Student groups of 6 or 7 were tasked with writing a complete scientific report.

**Workshop 4** – A progress review session was held for each group.

Staff found that the quality of the group report received fully met the learning outcomes for the module and students have developed and demonstrated feedback literacy.

## Patrice Behan and Eoin McGillicuddy

For further questions or feedback, the speaker can be contacted at patrice.behan@tudublin.ie.


**Integrating Sustainable Development Goals into Undergraduate Teaching**

**Integrating Sustainable Development Goals (SDGs) into Undergraduate Teaching**

Additional continuous assessment components were introduced to all modules during the pandemic.  To bring some variety to those assessments while meeting learning outcomes we examined options around the SDGs. To mark its 75th anniversary in 2020, the United Nations launched a global conversation on how to tackle the challenges we face and build a better sustainable future for all.  To contribute to this conversation a dialogue on the 'The Climate Crisis – A Race We Can Win' was facilitated with DT203/3 students as part of their Forensic and Environmental Chemistry Module.

In advance, to frame and inspire the dialogue students were:
- Provided with sample questions on 'The climate Crisis' which could be adapted as needed by the moderator during the dialogue.
- Provided with links to suitable pre-reading material especially around SDGs 6 & 14 which relate directly to water and how water can be used to fight climate change.
- Required to complete a short #UN75 online survey to get the conversation started.

Dialogue:
- An on-line dialogue between the class group was moderated.

Post Dialogue:
- Students provided a written reflection on the dialogue.
- Moderator compiled the responses, which in turn were distilled and compiled into a single TU Dublin response on 'The Climate Crisis' which was submitted to the UN in response to their call for contributions.

Assessment:
- Completion of the #UN75 online survey.
- Contribution to the discussion.
- Written reflection on the dialogue.

## Siobhan Daly

For further questions or feedback, the speaker can be contacted at siobhan.daly@tudublin.ie.

Many adaptations were made to TL&A, synchronous lectures, asynchronous lectures, changes to assessment practices, changes to examination formats all of which are common across all programmes.

It was recognised that a key to student success in the online environment is ongoing student engagement. This submission will focus on actions taken to encourage student engagement including:

- The use of Brightspace tools, assessment practices, T&L practices that were specifically introduced to increase student engagement in the context of remote learning.
- Engagement of Class Representatives across the school throughout lock down and beyond as an important element in our understanding of the student and their challenges.
- The use of clear, concise and relevant communication with students.

The submission will conclude with a summary of actions that can be continued beyond the current time to enhance student engagement.

## Steve Meaney

For further questions or feedback, the speaker can be contacted at steve.meaney@tudublin.ie.

The final year of both the BSc in Biomedical and Molecular Diagnostics, and the BSc (Hons) in Molecular Biosciences share a module entitled Bioentrepreneurship and Bioindustry skills. One of the teaching components includes a basic introduction to the use of project management software. A software-based assessment evaluates basic competency in creating a project plan, including Gantt chart, milestones and deliverables. In previous years MS Project has been used, with students developing competence on-site in the computer laboratories. However, TU Dublin does not have the capacity for remote access to MS Project for students. An alternate approach using a 30-day free trial of a cloud-based solution (SmartSheet) provided a workaround. The availability of this platform also facilitate remote practice for students whereas in previous years they were require to organise practice sessions around availability of PC laboratories. This platform also permits direct sharing of assessment with the lecturer, facilitating remote marking of the material as well as an output of the material in several different formats. This was a modest change of practice but enabled easy marking and comparison of submissions. This approach might suit other similar assessments, although with the caveat that the trial only permits 30 day access so timing of the teaching, learning and assessment is very important.

## Tao Zhang, Gemma Kinsella, Seana Hogan

For further questions or feedback, the speaker can be contacted at tao.zhang@tudublin.ie, gemma.kinsella@tudublin.ie and seana.hogan@tudublin.ie.

The goals of adapting the following approaches were to increase programme engagement with the students and the industry stakeholders through this challenging Semester (2020-2021) and continue enhancing students' employability.

1. The Annual TU Dublin Pharmacy Technician Industry Day Event took place in October via Bongo with guest speakers from 2 community and 2 hospital pharmacies. To further promote students' preparation and engagement with the event, online raffle was implemented. Students' LinkedIn pages (hyperlinked with numbers) was used in the raffle winning process. The students (DT425/2 & DT6425) were encouraged to update their LinkedIn profiles as a showcase to the audience. One industry pharmacy partner further enhanced the engagement by releasing a personalised discount code to the audience.

2. As a part of Student Professional Development Training plan, two new online workshops were implemented, "Interview Skills" and "Personality Style Identification", which were delivered by Ms Jill Barrett (Careers Office) to pharmacy technician students as advance preparation for work placement.

## Sarah Rawe and Claire McDonnell

For further questions or feedback, the speakers can be contacted at sarah.rawe@tudublin.ie and claire.mcdonnell@tudublin.ie.

Internationalisation at Home Through Online Collaborative Learning.

Working with Prof. Brett McCollum and his colleagues in MRU, who have run similar international collaborative partnerships in the recent years (E.g. https://www.cheminst.ca/magazine/article/global-pandemic-spawns-global-classrooms/), we partnered students from our 2nd and 3rd year organic spectroscopy modules with students from Mount Royal University (Calgary, Alberta) in small groups of 4-6 members and asked them to work together on two problem-based organic spectroscopy assignments.

In the first instance, students were asked to complete a very brief survey indicating their availability taking into account Dublin is 7 hours ahead of Calgary (E.g. for our students  - afternoons, evenings or either) so that they could be matched with MRU students with similar availability. Once groups were formed. students were given two spectroscopy problems containing all of the data that was required to deduce the structure of an organic compound, they were asked to organise two online meetings within a two week interval where they could discuss the problem with their group members. Each student submitted written answers along with a list of the group members involved in their discussions. Marks were awarded for group work and problem solving (their answer).

## Sara Boyd

For further questions or feedback, the speaker can be contacted at sara.boyd@tudublin.ie.

The TU869 Programme Team have responded in a positive and productive manner to the new virtual learning environment of teaching, learning and assessment. The EH team are mostly using Brightspace and Bongo for online delivery.  This is used in a synchronous and asynchronous manner.  We have availed of the online support from the LTTC along with their speedy response to our many queries. We are using Bongo and all its facilities – recording and sharing lectures, breakout rooms, discussions, quizzes, chat function and embedding clips and videos within presentations.  We are using a blended learning approach to achieve the learning outcomes.  We note full attendance at most of our timetabled lectures. We are also using the flipped classroom approach which allows for enhanced peer learning and groups discussion at 3rd and 4th year.  The PBL educational approach has developed even further during our response to COVID which has led to the development and enhancement of research, interpretative and risk-based decision-making skills of our EH students.

The EH Programme Team have put a lot of our energy into our first years with a positive online presence for tutorials and Q&A sessions.  We continue to engage with guest presenters from the private and public sector and deliver this online through Bongo.  Bongo facilitates external participants in a user-friendly mechanism.  Our tutors hold weekly online tutorials which students along with 1-2-1 student meetings on MS Teams.  We have also held an EH Café Style Session with our first-year group to facilitate a meet and greet type approach.  Student engagement and maintenance of this engagement has been our top priority whilst delivering high calibre professional education.   A variety of assessment methods have been used across the programme for example MCQs, long and short answer quizzes, posters, open book exams, reports, lab reports, presentations along with individual and groups-based assessments.  Within the Programme Team and the School of FSEH we have swapped ideas with colleagues at School meetings with follow up meetings and chats for more info.  There has been a great sharing of skills which has saved much time.

## Documented

### Leanne Harris and Marcus Maher

For further questions or feedback, the authors can be contacted at leanne.harris@tudublin.ie and marcus.maher@tudublin.ie.

A '**Students Learning with Communities**' project was incorporated into a Scientific Communication & Dissemination module for Stage 2 Biosciences students to address the following learning outcomes:

1. Demonstrate effective **presentation** and **communication** skills including use of **technologies**.
2. Develop **dissemination skills** to engage the scientific community and the **general public** with **Bioscience topics**.

This project was a new collaboration with Access & Civic Engagement and entitled *"Switch on STEM"* involving Biology themed workshops with primary school pupils and their parents. Small groups of TU Dublin students developed interactive resources to deliver short 10-minute demonstrations on a Biology topic of their choice, and of which they had good background knowledge from their programme modules. Students also generated educational infographics for the children, which formed the assessment piece for this module component. Topic examples ranged from Funky Fingerprints, Thirsty Plants and Glitterbugs, to Food Chains. The scheduled event could not be hosted due to COVID-19, but as a contingency, students submitted their infographics and received Certificates of Participation at the online Twitter Blitz hosted by SLWC. To adapt to the current online teaching environment and to maintain this community engagement piece, plans are underway to host a virtual event in Semester 2 of 2021 with the current Stage 2 students.

### Mercedes Jordan-Santana

For further questions or feedback, the author can be contacted at mercedes.jordansantana@tudublin.ie.

**Teaching:** As I have been teaching synchronously in Brightspace, I have developed a method of using quizzes to ensure students' engagement in the lectures. For example, after explaining a new concept or exercise, I open a quiz with two questions, that are easy enough for the students to work out in 5 minutes, to check that we are all on the same page before moving on. Meanwhile I am recording my live lectures so that I can make these available for reference purposes for the students, along with the accompanying PDF notes.

**Assessment:**  In the first year groups I have assessed the students using MCQ quizzes. This is very time consuming because it involves writing three different versions for one particular question - ultimately designing three exams instead of one. However, shuffling the question and sampling from the question pool seems to work well as the average of the marks were similar to the results in assessments from previous years.

**Tutorials:** I found that requiring students to upload their exercise solutions to Brightspace and working together through these, more actively engages them in the tutorial process, despite the physical distance.

## Jonathan McCarthy

For further questions or feedback, the author can be contacted at
jonathan.mccarthy@tudublin.ie.

With the difficulties experienced with Covid and the campus closure a change in the delivery of our modules on our Masters Qualifier was needed. Following the approval of the revised assessment strategy from Academic Council work was conducted to review alternatives to written exams. Our programme team evaluated their learning and teaching methods in preparation for the move to a fully online delivery. The assessment strategy was reviewed for all modules on the programme and a combination of open book exams and alternative assessments was used to replace the written exam component. One of the key technology components used in the transition to our online delivery was Bongo. The Bongo Virtual Classroom meeting space allowed us to engage with learners with livestream video sessions. The ability to chat with students using the live chat feature really helped to foster engagement and participation in the lecture and lab sessions. The chat facilitated general discussion with the class as a whole and private messaging with individual students where needed. One nice feature was the chat is stored with the recorded meeting, offering both students and staff the opportunity to review the public class discussions. For lab sessions Bongo breakout rooms offered individual support and screen sharing to collaborate with students and offer support with lab work and project assignments. Students participated well in the online classes and used our Brightspace and Bongo resources in an effective manner.