

 The logo for TAU Fellowships, featuring a shield with two figures holding hands and the text 'TAU FELLOWSHIPS' below.	TEACHING ADVANCEMENT AT UNIVERSITY (TAU) FELLOWSHIPS PROGRAMME	
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Project Title: Best Practice Guidelines for the Implementation of Technology Enhanced Learning, Teaching and Assessment Strategy in MIRS Department.

1.0 Significance of the project

Since 2014, the UJ has adopted the use of mobile technology (which includes smart phones, tablets, laptops / notebooks) to aid in learning, teaching and assessments (LTA). However, UJ does not have clear pedagogical guidelines with regards to designing the modules to align with technology enhanced teaching and learning. This project therefore sought to design best practice guidelines for the implementation of technology enhanced LTA strategy in MIRS Department.

2.0 Problem statement.

The strategic drive of the UJ is an important step and in the right direction in terms of the current educational developments. However, the implementation thereof has areas that need to be improved to ensure successful implementation. Preparation is an important part in terms of resources (infrastructure for internet, equipment for staff and students) and also staff preparation to ensure that the strategy is informed by the correct and suitable pedagogical approaches. This would enable the staff to ensure adequate design of the modules in line with the strategy.

The observation made is that there is lack of basic guidelines for the academic staff in terms of the procedure to follow in designing the modules in line with this strategy while making sure it is effective, authentic and is framed on proper pedagogical approaches. Staff, therefore, end up using the technology for the basic aspects like posting of notes and communicating with students while there are ample possibilities for the use of the technology as an effective LTA tool.

3.0 Project aim

The aim of this project was to develop best practice guidelines for the implementation of technology enhanced LTA strategy in the Medical Imaging and Radiation Sciences (MIRS) Department in order to ensure effective design and delivery of the modules with the use of appropriate pedagogical approaches. For the purposes of this project the best practice is defined based on Arendale (2015) who defines best practice as the wide range of individual activities, policies, and programmatic approaches to achieve positive changes in student attitudes or academic behaviors.

4.0 Methodology

The methodology used for this project is as shown in figure 1 below.

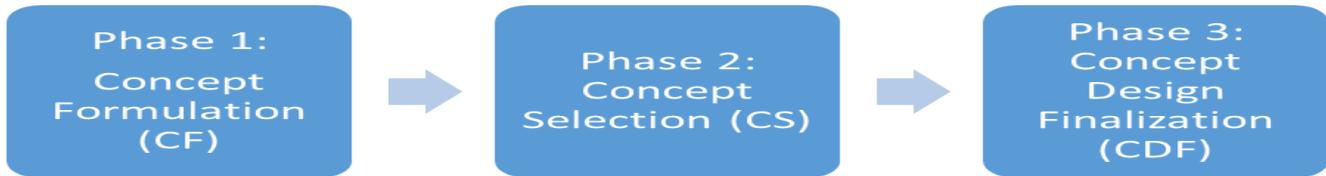


Figure 1. Project phases.

Phase 1: CF dealt with the consideration of multiple options that can be used for incorporation into the design through the review of relevant literature.

Phase 2: CS was a follow up on CF and sought to carefully refer the outputs of CF back to the aim and proposal of the project.

Phase 3: CDF will seek to implement the guidelines by presenting these to the staff of the Department of MIRS. This will be done in a form of a workshop/s with specific deliverables that will seek to maximize the buy-in to the guidelines (phase to be completed post residency for the Tau project). The time frame for the implementation would be determined with the consideration of that the project leader is currently completing his doctoral degree and it has to take priority.

5.0 Development of the Guidelines

Based on literature review and the visit to University College Dublin, identified as the best practice centre, the guidelines were developed as summarized in figure 2 below.

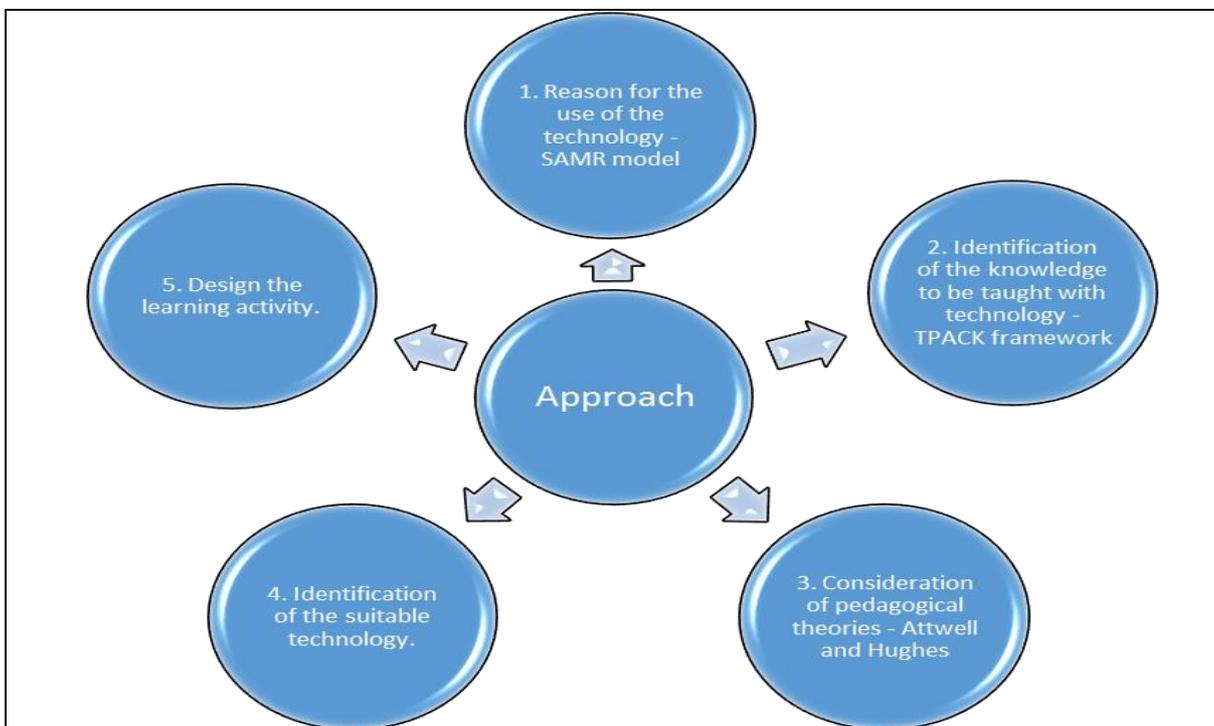


Figure 2. Step by step approach to the use of technology for LTA.

5.1 The reason for the use of technology

The reason for the use of technology is based on the model developed by Dr Ruben Puentedura (Victoria State Government, 2015).

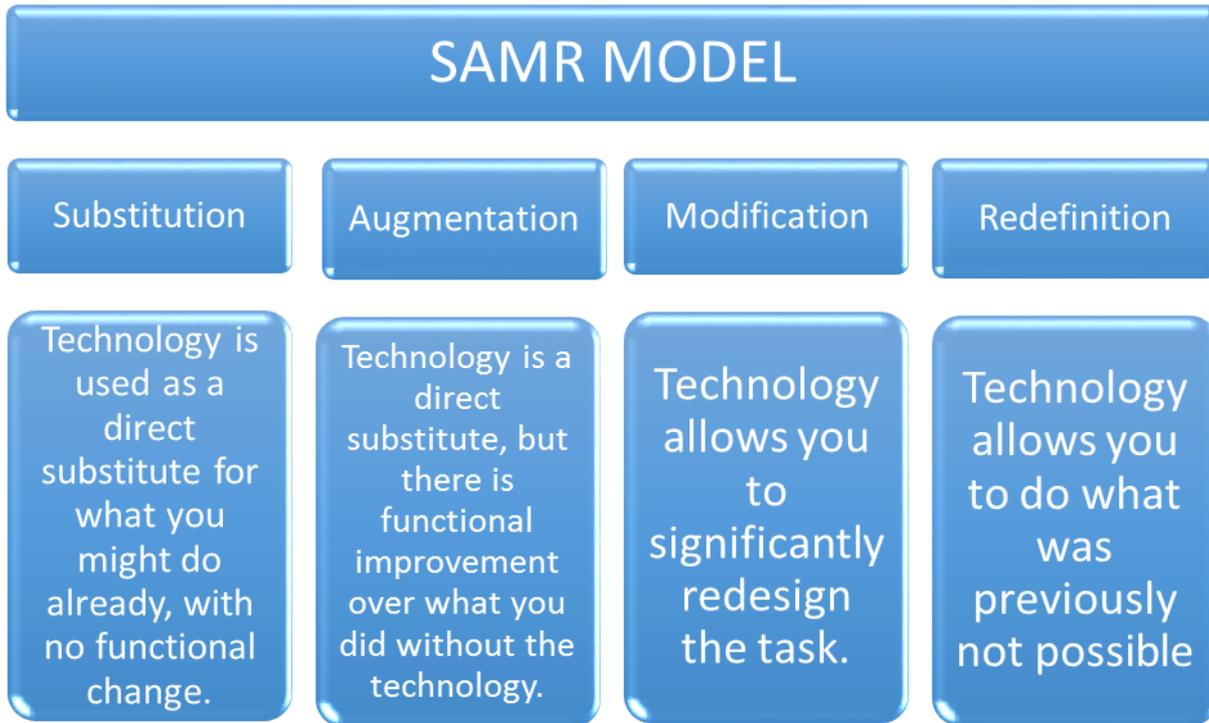


Fig 3 The SAMR model (Victoria State Government, 2015).

5.2 Identification of the knowledge to be taught with technology - TPACK framework.

Technological Pedagogical Content Knowledge (TPACK) is a framework that identifies the knowledge teachers need to teach effectively with technology (Koehler & Mishra, 2009; Mishra & Koehler, 2006; and Shulman, 1986). This is key to the successful use of technology for teaching. If the technology is used to teach the knowledge that is not necessarily suitable to be taught through technology, failure is imminent.

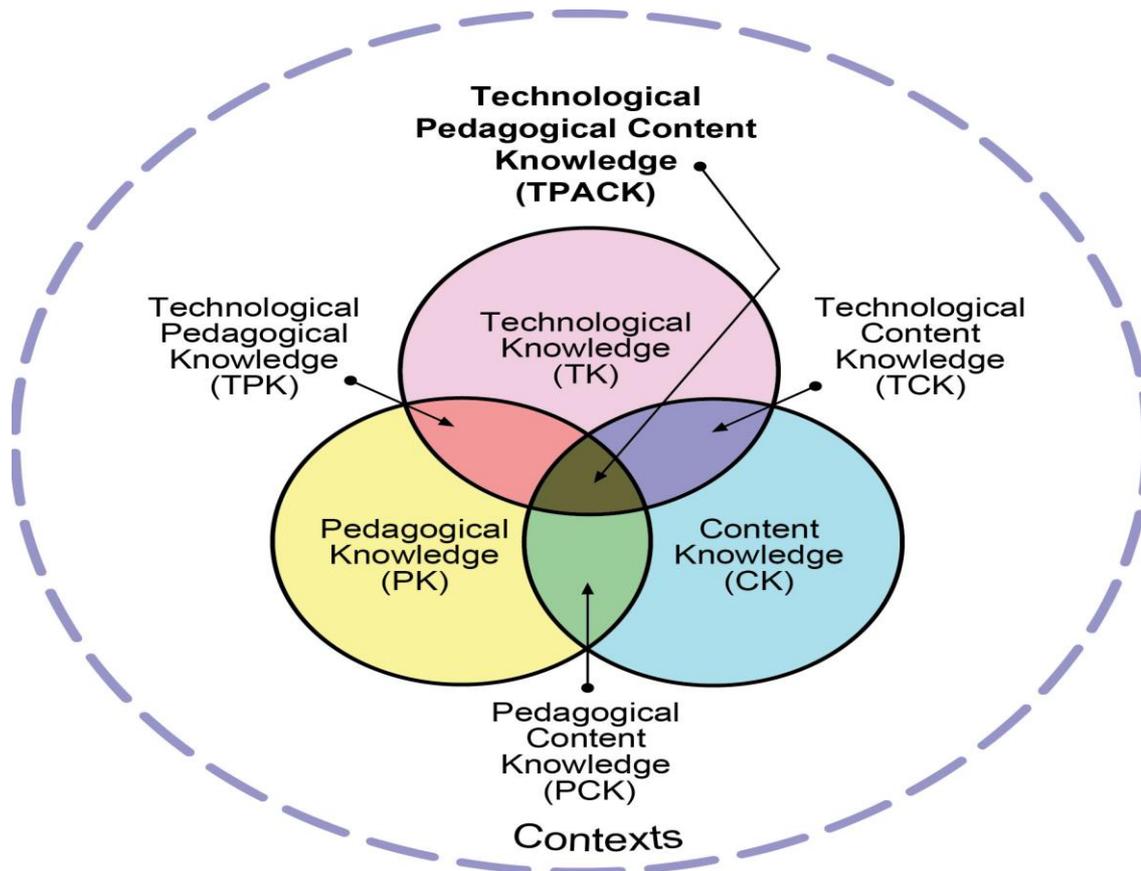


Fig 4 The TPACK model (<http://www.tpack.org/>) (Reproduced by permission of the publisher, © 2012 by tpack.org).

5.3 Consideration of pedagogical theories

Recently there has been an increasing interest in pedagogical theories and the related processes that inform the use of technology (Attwell & Hughes, 2010:15). Such an increasing interest may be related to the fact that in many instances, teaching with technology has failed to have the expected impact on learning processes. It is perhaps prudent to have fine scrutiny of the pedagogical approaches.

Attwell and Hughes (2010:15) highlight that recent literature with regards to pedagogy for using technology advocates for the move towards constructivist approaches. The core of constructivism is that learners actively construct their own knowledge and meaning from their experiences (Attwell and Hughes, 2010:16; Educational Broadcasting Corporation (EBC), 2004; Learning-theories.com, 2016; University of Sydney, 2016). The same authors also argue that constructivism is not a pedagogy rather a paradigm. Doolittle and Camp in Attwell and Hughes (2016), put forward eight principles that provide the essence of constructivist pedagogy which clearly highlights the student's role in knowledge acquisition through puzzlement, experience, reflection and construction. These eight principles are as follows:

- ✓ Learning should take place in authentic and real-world environments.
- ✓ Learning should involve social negotiation and mediation.
- ✓ Content and skills should be made relevant to the learner.

- ✓ Content and skills should be understood within the framework of the learner's prior knowledge.
- ✓ Students should be assessed formatively, serving to inform future learning experiences.
- ✓ Students should be encouraged to become self-regulatory, self-mediated, and self-aware.
- ✓ Teachers serve primarily as guides and facilitators of learning, not instructors.
- ✓ Teachers should provide for and encourage multiple perspectives and representations of content.

Constructivism has specific classroom approaches which are different from the traditional approaches. These approaches allow the learners the opportunity to construct their own knowledge and meaning in context.

6.0 References

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Annexure 1. Reflection on the visit to University College Dublin (UCD)

In 2015 I was selected to be part of the Teaching Advancement at University (TAU) project which has 52 members who come from all universities across South Africa. The TAU project requires each participant to complete a project whose aim is to advance teaching at university. The project that I chose is entitled “**Best Practice Guidelines for the Implementation of Technology Enhanced Learning, Teaching and Assessment Strategy in MIRS Department.**” In line with this project, I identified UCD Radiography Department (UCD Rad) as the “best practice” department. I therefore planned to visit this department for physical review of their use of technology for teaching. I also planned to engage colleagues from other departments within UCD to initiate collaboration between these and the UJ counterparts. The other department that were targeted were Nursing, Environmental Health and Physiotherapy / Sport and Movement Studies.

All the arrangements for the engagements during the trip were made with Dr Jonathan McNulty who put together a programme for my meetings and engagements.



Photo taken at the front of the Health Sciences building.

Highlights

During the trip I had a total of 18 meetings in three days, four of these meetings were beyond the TAU project scope as they sought to engage other departments with a view of fostering collaborations with their UJ counterparts. The UCD colleagues made me feel welcome and every meeting that I held was held with collegiality. Where relevant, the discussion was followed by a demonstration on the computer especially with the use of Blackboard and its relevant resources. Annexure 1 highlights the salient points of the discussions and the areas that need follow up.

The first meeting was held with Prof. Bairbre Redmond (Dean of Undergraduate Studies & Deputy Registrar / UCD U21 Lead) and Dr. Jonathan McNulty (Head of Subject Radiography). This was a very positive start to lay a foundation for the meetings that were to follow. Prof Redmond also expressed that she will invite me to attend the upcoming U21 Educational Innovation Conference to be held in Birmingham by the end of October 2016. This conference bring together all the U21 partners and each institution can be represented by a maximum of 3 representative.



Photo taken with Prof Redmond

The other highlight was the concluding meeting held with Dr McNulty and Prof. Louise Rainford (Associate Dean, Radiography). This meeting was held to wrap up important areas that need follow up and these are summed up below:

- Completion of the TAU project in line with the work done already and linking to the lessons learnt during the UCD visit.
- Consider various software that can be adopted to enhance the use of technology for teaching and the use of Blackboard. These are highlighted in **green** in annexure 2 below.
- Completion of the article by Sibusiso and Dr McNulty in-line with the TAU project. The article is currently in the planning phase and the aim is to complete it by the end of 2016.
- Follow up on the presentation to be made at the Heltasa conference in Cape Town, already accepted for the poster. The submission was made with Sibusiso and Dr McNulty as authors. Poster to be compiled.

- Further engagement needs to be made on the intercountry research project with a view to have UJ involved in 2017.

Other significant highlight are the following:

- The existence of the group that focuses on sharing practice in the use technology at UCD School of Medicine. To consider starting a group at the UJ Faculty of Health Sciences that will engage on issues related to the use technology in teaching. This group will share expertise and showcase to each other their work. The aim would be to enhance the project of staff development and learning together.
- The use of **my knowledge map software** to replace the manual logbook. The UJ MIRS needs to prioritise purchasing this software as part of the project to move use electronic log book that has been investigated for some time.
- The employment of Educational Technologists (Edtechs) within the School of Medicine at UCD. This strategy enhances the implementation of the use of technology for teaching. It may be useful for UJ to adopt a similar practice.
- Student can complete the assessment wherever they are for the some assessments.

Annexure 2: Summary of the discussion points and areas for follow up.

Purpose and name of person met	Points of discussion and areas for follow up (the points below are just salient points).
<p>Welcome Prof. Bairbre Redmond, Dean of Undergraduate Studies & Deputy Registrar / UCD U21 Lead; Introductory meeting Dr. Jonathan McNulty, Head of Subject Radiography</p>	<p>Points discussed:</p> <ul style="list-style-type: none"> • Discussed the approach of “partialise” learning outcomes in order to maximise the student understanding of the subject matter. • Approaches to maximise staff participation and use of technology in teaching: <ul style="list-style-type: none"> ○ Pop up lunch time sessions – aiming to develop staff use of Blackboard. ○ Small classes of staff with specific deliverable tasks that they can implement e.g. 10 days of twitter. Always start with a small group as a pilot. ○ Redesigning Blackboard to ensure that it has fewer buttons and therefore more user friendly. • Importance of reflective practice for both staff and students. Highlighted the importance of staff being able to reflect on their own practice and improving it to ensure student success. • Importance of effective timing of interventions so that it impacts positively on the assessment of students. • The use of the assessment for learning approach instead of the learning for assessment approach coupled with the number of assessments that the students have to complete. UCD does not have a policy that prescribes the number of assessments per module. • The U21 consortium has groups that work on the following: Educational innovation (Prof Redmond is active on this); students mobility programme, research. <p>Areas for follow up:</p> <ul style="list-style-type: none"> • Prof Redmond will send an invite to Sibusiso to attend the Educational Innovation Conference in October to be held in Birmingham. Each member of the U21 has 3 places within the conference. • Sibusiso to further engage Prof Redmond on the issues of reflective practice. • The ideas discussed above in terms of staff development to be considered as part of the Tau project guidelines.
<p>TEL across the School of Medicine Mr. Adam Tattersall, Technology Enhanced Learning Manager</p>	<p>Discussed points:</p> <ul style="list-style-type: none"> • The Faculty has the educational technologists (Edtech) team of 4 staff members that serves about a 1000 staff members. • The 4 staff members have varying backgrounds which include IT, programming, etc. • Edtech staff are the conduit between the IT and academic staff members. • Edtech staff assist mainly with the design of Blackboard modules and online courses, and roles include recording of presentations, going to various sites to make videos, assisting with the running of conferences etc. • The Edtech unit has a model used to ensure smooth designing of online courses – need to ask Adam for this as an example. • Examples of useful software includes: <ul style="list-style-type: none"> ○ Blackboard collaborate Ultra. ○ Re-usable learning object. ○ Story line. ○ Video scribe. ○ Drag and dictate software. • Explain everything (similar to mirror op). • The Edtech office has a special recording booth that assists in maximising the quality of the sound. • The Faculty has a shared Google Drive folder that required all staff to create Gmail accounts. • Adaptive release of content. <p>Areas to follow up:</p> <ul style="list-style-type: none"> • Importance of having Faculty dedicated Edtechs. • Explore the various useful software to maximise the use of Blackboard. • Need to follow up with Adam on the use of some of the above listed software.
<p>Interventional online programme Ms. Marion Maher, UCD Radiography and Diagnostic Imaging</p>	<p>Points discussed:</p> <ul style="list-style-type: none"> • The discussion points tailored up on the discussion with Adam. • Importance of paradigm shift when moving from contact lecture to online courses. This is important since one has to ensure that the design is sufficient as there is no time for students to ask questions just like it happens with the face-to-face lectures. • Importance of adaptive release of course content that allows the students to pace themselves in the learning e.g. one lecture per week. • Importance of having formative assessments at regular intervals to ensure that students understand the work. These can be designed such that student cannot progress to the next session until they have achieved the desired results for the formative

	<p>assessment.</p> <p>Areas to follow up:</p> <ul style="list-style-type: none"> Review the online Interventional Radiology course.
<p>Paediatric and Child Welfare & Protection online programme Dr. Michaela Davis, UCD Radiography and Diagnostic Imaging</p>	<p>Discussion Points:</p> <ul style="list-style-type: none"> Has designed a programme with a strong interdisciplinary education – MSc Non Accidental Injury. Offered with Nursing, Radiography and Social Work. Uses a lot of clips and videos (vimeo) to demonstrate to demonstrate relevant educational material – professional person used for the recording of the videos. Also uses the approach of adaptive release to regulate the learning process. The programme is open to anyone who works with children. Uses a lot of discussion boards with the students – engages students consistently. <p>Areas to follow up:</p> <ul style="list-style-type: none"> Adoption of the use of videos as a teaching tool to demonstrate relevant aspects. Review this model of interdisciplinary teaching.
<p>School of Medicine E-Learning Showcase</p>	<p>Discussion points:</p> <ul style="list-style-type: none"> Meeting held to showcase the latest developments in the use of Technology within the faculty. Presentations made by Adam and the team, the presentation had a similar content to aspects already discussed with Adam on the one-on-one session. The meeting was attended by a group of about 20 academic staff who are actively involved in the use of technology for teaching and e-learning platforms. Various software discussed: <ul style="list-style-type: none"> Podcasts. Online story line. Reusable Learning object Recorded live lecture – recorded using echo 360 software. Supplements: <ul style="list-style-type: none"> MedEd podcasts. Blackboard collaborate Ultra. Explain everything. Video scribe. There are 17 styles of tests that can be done on Blackboard. Use of 360 degrees camera for taking photos that can be manipulated in 360 degrees. <p>Areas to follow up:</p> <ul style="list-style-type: none"> Consider using these software for own teaching and TAU report. Special attention to Blackboard Collaborate Ultra and echo 360 degree. Consider starting a similar group at the Faculty to enhance the project of staff development and learning together.
<p>Ultrasound online programmes Dr. Mary Moran, UCD Radiography and Diagnostic Imaging and Anne Fleming</p>	<p>Discussion Points</p> <ul style="list-style-type: none"> Ultrasound offered as an MSc programme over 3 semesters – 16 months, and has a 1000 compulsory clinical hours. Aspects covered in the course include technology, Obs, obs and gynae, superficial structures, vascular. The programme is not offered to Radiographers only, offered to Midwives, Medical Doctors etc. The students attend 2 days every second week. Currently the online programme is used for the certificate courses which have a duration of 9 months. The Department has a transvaginal scanner which is very useful to afford the students the necessary harnessing of the skills. The success of this course is founded on the functional communication between the students, practices / clinical centres and the lecturers.

	<ul style="list-style-type: none"> • The programme will be moving to my knowledge map as a form of electronic logbook. • Radiographers and midwives are allowed to give full reports on scans performed. • Mary has supervised several masters students and will be taking 2 new PhD students in the near future. She is keen to consider taking on supervision of a staff member from UJ (Brenda) depending on the suitability of the topic. • The staff are part of the Ultrasound Research consortium (Perinatal Ireland) which is inclusive of 8 hospitals, some of which are in Belfast. <p>Areas to follow up on.</p> <ul style="list-style-type: none"> • Consider some aspects of the design of the above programme when designing the clinical masters at UJ. • In designing the post graduate diploma programmes or short learning programmes for US, consider some of the approaches. • Follow up with Mary with a view to work with Brenda for PhD. • Use a similar model to that of the research group to start such within the UJ context working with the clinical centres or other academic institutions.
<p>Online modules and CPD content / E-Portfolios Dr. Shane Foley, BSc Radiography Coordinator</p>	<p>Discussion points:</p> <ul style="list-style-type: none"> • Shane is currently responsible for the new software that the Department has purchased to replace the paper logbooks. • The software is called my knowledge map and it comes with an annual licence and was found to be user friendly and priced well. • Other software that the Department had considered are Awix and Peble Pad. • The software will be useful for constant clinical progress monitoring of students. • The software also has my showcase which allows students to compile their own portfolios that they will have access to even after completing their studies. • Shane is also involved with the online Dental programme offered jointly with Trinity College. He shared several aspects of the design of the programme. • Students are given 2 hours new material every week and formative assessments are used. • Since the programme has no face-to-face lectures except the initial contact session, the discussion boards are used significantly. There are 3 forums that Shane uses: general discussion forum (designed for students to engage each other, even though the lecturer has access to this one he chooses not to view it and allows the students to take control of their discussions), forum regarding lectures (students can use this platform for engaging the lecturer) and tutorial forum (used for matters related to tutorials – there is a forum for each tutorial that has been completed). • Blackboard Collaborate is also used significantly, for the inline programme, 2 hours per week is dedicated to this. It creates a room where students can join voluntarily and have discussions with the lecturer. These are stored and can be accessed at another time. • Online offering also used for CPD related activities. • Adobe Captivate used for adding voice to written words. <p>Areas to follow up on:</p> <ul style="list-style-type: none"> • Consider options to purchase my knowledge map in line with the Department's strategy to move away from paper logbooks. This might be more affordable when considering that other software were found to be too expensive. • Adopt the use of discussion forums. • Also adopt Blackboard Collaborate Ultra to allow effective engagement with the students.
<p>Health Sciences / Campus Tour Mr. Nicola Giannotti, Graduate Demonstrator</p>	<p>Areas visited: (Nicola is also doing his PhD).</p> <ul style="list-style-type: none"> • The fully digital x-ray room which has its own PACS and RIS with the phantom for teaching purposes. It also has a large monitor that can be connected to the laptop for demonstrations. • Library. • Nursing skills lab (could not get inside). • Computer Assisted Learning laboratory.

	<ul style="list-style-type: none"> • PACS room which has about 20 PACS dedicated computers. • Research room which has about 4 dedicated research computers which has superior functionality which allows analysis of images etc. • Also visited the historical centre across the cafeteria. <p>Areas to follow up:</p> <ul style="list-style-type: none"> • I envied the PACS room and the research centre. These are a must have if the Department is to enhance its research strategy and also prepare students adequately for the clinical environment. • Fully digital x-ray room. • It would be nice to have monitor in the x-ray room.
<p>E-Portfolios Mr. Mark Carty, <i>Educational Technologist, School of Veterinary Medicine</i></p>	<p>Discussion points:</p> <ul style="list-style-type: none"> • Discussed my knowledge similar to what was discussed with Shane. • Highlighted the importance of getting external hosting to ensure smooth functioning of the software and not having to bear the maintenance costs etc. • Mark demonstrated the software on the iPad.
<p>RIS PACS E-Learning Dr. John Stowe, UCD Radiography and Diagnostic Imaging</p>	<p>Discussion Points</p> <ul style="list-style-type: none"> • John gave a presentation that he will share with me. • The presentation highlighted how he uses the PACS room and Blackboard as the approach to his teaching. • It also highlighted how the students experience his teaching approach. • The key thing that was observed is how his approach forces the students to engage with the work and to work consistently. For example, he release the notes on a Friday and delivers the lecture on the notes on a Tuesday of the following week followed by tutorial on a Thursday. For each session students must come prepared and each session is followed by a quizze which is a high level multiple choice questions. • The subject does not have any final year examination. • The subjects has a very high pass rates and the students achieve high grades. • I personally observed the enthusiasm that John has with the subject. • John also demonstrated the Blackboard and the PACS system on the PACS room. <p>Areas to follow up.</p> <ul style="list-style-type: none"> • Get the PPT presentation from John. • Engage John in future with a view to work with F Mulla on her doctorate. • Adopt some of the approaches that John uses to get the students to work consistently.
<p>Centre for Safety and Health at Work Prof. Anne Drummond, Centre Director; Mr. David O'Dwyer, Centre Manager</p>	<p>Discussion Points</p> <ul style="list-style-type: none"> • The UCD colleagues provided some material on courses offered and these will be shared with the UJ colleagues. • Of note was that all their programmes are offered to individuals that are already working in the industry and the entrance requirements are not based on the school leaving results. • The Department has a College Knowledge folder on Blackboard. This folder is basically orientate the students on the university and its processes. It replaces the ordinary orientation programme. • The MCQ that are administered for summative assessments allow the students to complete it in their own location within a prescribed time allocation. Students do not need to be in a specific venue to complete the assessment. • The preparation of the lectures for online learning uses Articulate Story Line – a specialised software. A demo of how this software is used was made. This software has an annual purchase fee which could be for an individual or the faculty/university. <p>Areas to follow up:</p> <ul style="list-style-type: none"> • Information on courses and relevant information will be shared with the HoD of Environmental Health at UJ. • Consider the purchase of the Articulate Story Line. • Consider the Adoption of the Faculty Knowledge folder for orientation of students.

<p>University E-learning Initiatives and Digital Badges Ms. Aine Galvin, <i>Director UCD Centre for Teaching & Learning</i>; Mr. Jonathan Flynn, <i>Educational Technologist Centre for Teaching & Learning</i></p>	<p>Discussion Points:</p> <ul style="list-style-type: none"> • This Department focuses on working staff for the whole institution and reports directly to the Dean of Undergraduate Studies and Deputy Registrar who is also a UCD U21 Lead. This Department is equivalent to the Staff Development Unit of UJ. • The Department also works closely with the IT Department. • The practitioners in the Department reported that they have found it difficult to write a proper strategy for the use of technology for teaching. • They also indicated that Edtechs positions only exist within Health/Medicine Faculty and a few others but most Faculties at UCD do not have Edtech positions. • The colleagues from UCD shared some information especially the models used within their domain. <p>Areas to follow up:</p> <ul style="list-style-type: none"> • Review the documents shared and follow up where relevant.
<p>Translational medicine online programme Mr. Gareth Shaw, <i>Business Development Manager, UCD Clinical Research Centre</i></p>	<p>Discussion Points:</p> <ul style="list-style-type: none"> • This meeting was used partly to catch up on U21 International Developers matters since Gareth was previously the chair of this group (while employed at the UCD School of Medicine International office) before moving to the Translational Medicine Programme. • Gareth also took me on tour of the UCD sports Facility. • Gareth also provided the different courses that are offered within the Clinical Research Centre within which the Translational Medicine Online Programme is located. • The Graduate Certificate in Clinical and Translational Research has been designed to be a full online programme which begins with a foundational programme then followed by the following – clinical trials; Data management & biostatistics; clinical trial management. • This course could be useful to provide a platform for solid training in clinical trials and statistics. • UCD could consider giving discounted fees to UJ staff. <p>Areas to follow up on:</p> <ul style="list-style-type: none"> • Review this course for suitable training of staff in clinical trials and relevant aspects.