A one-day Symposium
organised by the AMEE Technology Enhanced Learning (TEL) Committee

Saturday 24 August 2019
Austria Centre Vienna

ePoster Presentation
Abstracts

#TEL2019
Co-creating Compassionate Care: A Digital Curriculum for Health Professionals

AUTHOR(S):
- Javeed Sukhera, Schulich School of Medicine and Dentistry, Western University, Canada (Presenter)
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ABSTRACT

Growing evidence suggests health professionals can be trained to improve empathy, and enhance compassion towards their patients. Unfortunately, efforts to implement compassionate care curricula are often constrained by organizational culture, as well as a longstanding gap between knowledge synthesis, and translation. Technology enhanced learning has the potential to promote real-time delivery of compassionate curricula through shared knowledge exchange, and democratizing expertise. We describe the co-construction of a digital curriculum to promote compassionate care for youth suffering with mental illness. Using principles from participatory action research, we engaged with youth who have lived experience of mental illness, as well as health professions students, to establish a framework for a digital stigma-reduction curriculum. We translated our framework into a digital curriculum for youth with mental illness, as well as medical, and nursing students, and established an evaluation strategy that integrates educational theory with participatory principles. Our co-constructed curriculum includes online inter-group contact, e-learning, and digital reflection exercises. Learning activities seek to increase empathy, trust, and connection between health professionals and their patients. Our digital curriculum provides an innovative example of how technology enhanced learning may enhance the scale, and spread of compassionate care curricula. Wider dissemination of compassionate care curricula through digital technology may promote both continuous, and adaptive learning. Ultimately, technology enhanced learning may promote compassionate care, and improve outcomes for marginalized, and vulnerable populations.
Development of novel audiovisual resources incorporating clinical examination of pathology: a pilot study

AUTHOR(S):
- Daniel Wheeler, GKT School of Medical Education, King's College London, UK (Presenter)
- Ahmed Al-Jabir, GKT School of Medical Education, Kings College London, UK
- Claudia Moore-Gillon, GKT School of Medical Education, Kings College London, UK
- Mark Kelly, Guys and St Thomas NHS Foundation Trust, UK
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ABSTRACT

Background: Technology Enhanced Learning (TEL) is an increasingly common mode of delivery for high-fidelity yet readily accessible medical education. Medical students often have access to audiovisual materials of clinical examinations of basic human systems, however these do not extend application of skills to the setting of pathology. The opportunity to clinically examine pathology varies tremendously across clinical teaching sites due to various factors, including divergent population demographics, accommodating each patient’s wishes and dignity, and navigating different services offered by individual healthcare settings.

Summary of work: For more consistent and well-rounded teaching, we aim to produce a high-definition audiovisual TEL resource, creating a video library encompassing clinical examination of pathology aimed at all stages of medical education. Initially we produced an updated audiovisual resource for clinical examination of the abdomen without pathology in order to ascertain, via focus groups involving senior medical students and qualitative and quantitative data outlining perspectives, the most efficacious techniques to inform future videos with pathology. Various outpatient clinics in St Thomas’ Hospital, London were subsequently filmed producing an ongoing catalogue of pathology being clinically examined; examples so far including inguinal and umbilical hernias.

Summary of results: We administered twenty pre- and post-video 5-point Likert scales and open-ended questions. All respondents indicated they thought the resource should contain examination of the pathology ± pictures of signs, the mean Likert response (5=extremely relevant/confident) to ‘Was this video relevant to your medical education’ =4.9±0.18, and to ‘Does this video help you feel more confident in carrying out the examination’ =4.2±0.29.

Discussion and Conclusions: We present data supporting the usefulness and implementation of this TEL resource in a UK medical school. We aim to collaboratively expand this educational catalogue demonstrating examination of pathology and to ultimately assess its educational impact. To aid delivery of comprehensive medical education, given lack of access to pathology in different demographic areas of a resource-limited healthcare system, there is a defined need for high-definition audiovisual materials illustrating clinical examination incorporating pathology across additional and applicable organ systems.

Take-home Messages: Applying audiovisual TEL to clinical examination, focusing on pathology, is a powerful development from currently available medical education resources.
Engaging Learners and Preceptors in UGME using EPAs and Mobile Devices

AUTHOR(S):
- Norah Duggan, Memorial University of Newfoundland Faculty of Medicine, Canada (Presenter)
- Donald McKay, Memorial University, Canada
- Tom Laughlin, Memorial University, Canada
- Katherine Stringer, Memorial University, Canada
- Stephen Pennell, Memorial University, Canada
- David Stokes, Memorial University, Canada

ABSTRACT

Entrustable Professional Activities (EPAs) are increasingly used as assessment frameworks for competency-based medical education (CBME). For student assessment, Memorial University adopted the Association of Faculties of Medicine of Canada (AFMC) EPAs and added a 13th EPA on interprofessional collaboration. Previously, students were assessed by preceptors who after each activity filled in handwritten clinic cards. Aggregating data from the handwritten documents was labour intensive, so an electronic process was devised in collaboration between Memorial University and Resilience Software to document the feedback conversation between preceptor and learner. The new process enabled the school to implement a method of programmatic assessment and to generate learner-specific or aggregate data reports quickly. This presentation will highlight the implementation process and the barriers and facilitators to change in introducing a mobile device app as a tool for facilitating timely feedback to clinical learners.
Technology and the transformation of medical education
A one-day Symposium | Saturday 24 August 2019

TEL Symposium ePosters 1

TEL 1/4 (3160)
Date of Session: Saturday, 24 August 2019
Time of Session: 11:15-12:30
Location of Session: Hall F, Level 0

Technology Enhanced Learning: Cultivating innovation and recognising the need for training

AUTHOR(S):
- Sara Warraich, PGME, Great Ormond Street Hospital, UK (Presenter)
- Craig Knott, PGME, Great Ormond Street Hospital, UK
- Jeroen Poisson, PGME, Great Ormond Street Hospital
- Justin Poisson, PGME, Great Ormond Street Hospital, UK
- Holly Boyd, PGME, Great Ormond Street Hospital, UK
- Simon Blackburn, PGME, Great Ormond Street Hospital, UK

ABSTRACT

Background: There is national recognition that a digital future requires preparation of our workforce towards it (NHS Topol review). We sought to engage our workforce to see the potential to innovate and incorporate technology in the field of medical education.

Summary of work: We developed a forum where staff could have interactive face-to-face discussions around areas of technology enhanced learning (TEL). These are now hosted in our Digital Research Informatics and Virtual Environment (DRIVE); a setting designed for technological innovation. Each forum has two components:
1) Invited speakers with experience in technology enhanced learning. This includes those who have created Apps and others who recognise the need for staff training, to prepare for a digital future.
2) Interactive breakout sessions, aiming to cultivate discussion and problem-solving. The groups are encouraged to consider an idea for TEL and theoretically map the process to success, anticipating potential challenges and solutions, which they can then discuss with the speaker.

Summary of results: Forums so far have attracted around 15-20 participants, consisting of staff from diverse backgrounds, ranging from doctors to senior configuration analysts. We asked for formal feedback on the forum, which notes positively the role of the breakout sessions and of the discussion around integration of technology within the NHS. All participants who fed back said they would return again.

Discussion and Conclusions: With machine-assisted learning and healthcare on the horizon, we believe that a creative space for discussion around ideas is important to encourage innovation. Through our TEL forums we aim to provide such a space. For future forums, we will now invite software students to attend. We hope this will create a greater understanding of roles between clinicians and computer scientists. This is in recognition that the future is likely to make collaborative working between these two sectors essential.

Take-home Messages: This forum provides a useful platform to discuss ideas for innovation and map the journey to success.

References: References will be provided on the poster
The Virtual Coffee Room: encouraging reflection and learning from incidents.

**AUTHOR(S):**
- Andrew Hughes, University Hospitals of Leicester NHS Trust, UK (Presenter)
- Vishal Dhokia, Sherwood Forest Hospitals NHS Foundation Trust, UK

**ABSTRACT**

**Background:** Ensuring lessons are learnt from incidents is a crucial part of organisational development. Summary findings are often communicated via trust email (passive learning) or during face-to-face morbidity & mortality meetings (variable attendance). Furthermore, trainees do not often use their trust email account due to the frequent nature of rotations and experience difficulty attending M&M meetings due to oncall commitments, post-oncall rest days, training list opportunities etc.

**Aim:** To explore the feasibility of WhatsApp for synchronous (real-time) discussions between small groups of trainees. Methods: We conducted two separate, 1-hour, virtual discussions with anaesthetic trainees using WhatsApp on a weekday evening: one based on a trainee's own experience of a critical incident on the labour ward and one relating to an investigation into a retained PICC stylet (Peripherally Inserted Central Catheter). A WhatsApp group was created for trainees and participants agreed to abide by specific ground-rules. An anonymised pre-recorded case summary was presented after which a facilitated discussion took place between participants. Questions were prepared by facilitators in advance and they helped keep conversation on topic. Discussions were summarised and used as documentary evidence for reflection and learning. Results: 9 and 7 trainees took part in the first and second discussion respectively. All found the experience useful and would participate again. Active learning processes are more evident in comparison to a safety lecture or email communication. Some participants expressed the risk of misinterpretation when compared to face-to-face discussions although none felt their points were misinterpreted. Further suggestions on management going forward were communicated to relevant parties (department of anaesthesia & directorate of patient safety).

**Conclusion:** Trainees found it easier to access the discussion. Not all participants contributed equally. Typing speed and pace of the discussion thread were limiters. Deeper analysis and critique were evident in participants comments. Take home: use a platform which is already familiar to your audience and is encrypted, provide participation ground-rules, ensure confidentiality/anonymity of cases, consider WhatsApp Web (desktop function) as instead of a mobile phone (for ease of reading/typing), consider follow-up actions if further learning needs are identified (e.g. signposting, escalation) or misconduct.
Technology and the transformation of medical education
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TEL Symposium ePosters 2

TEL 2/1 (3465)
Date of Session: Saturday, 24 August 2019
Time of Session: 2:30:00 PM-3:30:00 PM
Location of Session: Hall F, Level 0

Just-In-Time Learning Technology To Integrate Basic Science In Clinical Setting: Clinical Science Inquiry (CSI)

AUTHOR(S):
- So-Young Oh, NYU School of Medicine, USA (Presenter)
- Jillian Halpern, NYU School of Medicine, USA
- Amy Rapkiewicz, NYULH, USA

ABSTRACT

It is vital that students continue to identify the connections between foundational medical knowledge (basic sciences) and the care that they deliver to their patients. Data often indicate that there are gaps in basic science exposure and the application of pre-clerkship basic science teaching in the clinical years, specifically during clerkships. To support longitudinal learning, without overwhelming an already heavy workload, NYU School of Medicine used a survey platform, Qualtrics, to develop a series of 5-minute formative quizzes to provide just-in-time basic science concepts in a clinically-relevant context. A mobile-friendly, just-in-time Clinical Science Inquiry (CSI) tool send the clerkship students 2-3 clinically relevant basic science questions every week during their clerkship. The questions include clinical cases, questions and answers, as well as explanation about the correct and wrong answers. More than 90% of the pilot participants reported that CSI was a helpful learning tool in providing clinically relevant basic science concepts.
Community-suggested Recommendation Engine for Medical Education

AUTHOR(S):
- So-Young Oh, NYU School of Medicine, USA (Presenter)
- Jesu Vensuslaus, NYULH, USA
- Helen Finkelstein, NYULH, USA
- Jillian Halpern, NYU School of Medicine, USA
- Marina Marin, NYULH, USA
- Michael Poles, NYULH, USA

ABSTRACT

In each medical school, students and residents use internal and external resources (e.g., textbooks, websites, videos, journal articles, etc.) to improve their medical knowledge, to prepare for high stakes exams, and to dive deeper into topics of their interest. Often, this hidden curriculum is shared between students and residents using various social media. To help learners and educators suggest and find relevant learning resources in a structured, curated and centralized way, the NYU school of Medicine designed an innovative resource sharing platform called Recommendation Engine (RecEngine). The main purpose of the RecEngine is to enable students to actively organize their learning pathway depending on their learning goals, preferences, past performance and available time. This personalization is accomplished using the interactive nature of the tool as well as the automated recommendation algorithm that links data (e.g., students performance scores, behavioral patterns, and personal characteristics) to specific learning resources. Launched in January 2019, the RecEngine displays more than 1000 learning resources for pre-clerkships and clerkships curricula, USMLE step exams, and the residency preparation. The usability test and user feedback showed that students highly evaluate the purpose of this tool and the filter functionalities. As next steps, we plan to analyze behavioral data in order to provide more personalized results using sophisticated recommendation algorithms.
Enabling constructive alignment using an online curriculum map

AUTHOR(S):
- Laura Wynn-Lawrence, Medical Education Research Unit, Imperial College, UK (Presenter)
- Rebecca Wilson, Medical Education Research Unit, Imperial College
- Rebekah Fletcher, Medical Education Research Unit, Imperial College
- Amir Sam, Medical Education Research Unit, Imperial College

ABSTRACT

Background: In order to encourage students to learn appropriately, learning outcomes should align constructively with teaching methods and assessment tasks. This is often challenging in clinical practice, where students may have difficulty aligning their clinical learning experiences to intended learning outcomes. As such, we aimed to enable constructive alignment through the use of an online curriculum map.

Summary of work: We developed an online curriculum map, which can act as a point of care learning tool. This allows students to search for learning outcomes according to presenting symptoms and medical conditions. We created a team-based teaching session: question-based collaborative learning (QBCL). This allowed us to direct teams of students to create multiple-choice questions based on real cases from their clinical placements. These were attached to a specific learning outcome before being submitted via the online curriculum map. These questions will be analysed according to a modified version of Bloom’s taxonomy in order to identify the cognitive domains assessed by the students’ questions.

Summary of results: The QBCL session was attended by 201 year 3 medical students, with 174 questions submitted. These were based on a variety of conditions and presentations. These sessions will be further evaluated by examining the students’ perceptions of the learning experience, and the quality of the questions produced.

Discussion and Conclusions: We developed an online curriculum map and designed a question-based teaching session which allowed students to write assessment items based on real patients, attaching them to the appropriate learning outcomes.

Take-home messages: The curriculum map allowed students to link their experiential learning to the intended learning outcomes; thus enabling constructive alignment.
Virtual reality MRI environment for teaching radiographers skills

AUTHOR(S):
- Marek Chmelik, Faculty of Healthcare, Presovska Univerzita v Presove, Slovakia (Presenter)
- Jan Cabadaj, Faculty of Electrical Engineering and Informatics Technical University of Košice, Slovakia

ABSTRACT

Virtual reality (VR) and augmented reality (AR) are two contemporary simulation models that are currently upgrading medical education. VR provides a 3D and dynamic view of structures and the ability of the user to interact with them. The recent technological advances in haptics, display systems, and motion detection allow the user to have a realistic and interactive experience, enabling VR to be ideal for training in hands-on procedures [1]. It's especially true if one considers training with expensive and complicated radiodiagnostic equipment, which includes safety issues connected with ionizing radiation (e.g. X-rays) or strong magnetic fields (e.g. MRI). Furthermore, extensive use of such equipment in clinical settings complicates teaching of radiographers during the heavy-duty periods of the day directly in radiology departments. Virtualization of such equipment and creation of model situations are possible within VR.

Here we present VR environment of standard MRI unit. MRI environment was programmed in Unity technology software [2]. VR MRI environment includes two rooms, the first with the console and the second scanner room with dynamic VR model of MRI scanner. Environment includes avatar patient, fully working MRI table, MRI scanner with operation buttons, cross laser, headset, alarm ball and set of the RF coils. Student is immersed into the VR and may choose between several standard MRI examinations, may position the patient and the coil, offer headset and alarm ball to the virtual patient. Then using the cross laser and buttons may move the table inside the MRI scanner.

Presented VR MRI environment allows students to prepare for future work in a safe environment. It recreates conditions that closely simulate reality, while removing any danger existing in MRI units (e.g. strong attractive magnetic force of the superconducting magnet). It means that when students confront a similar MRI environment in a real situation, they do so with the experience of detailed rehearsal.

1. Pantelidis et al. Virtual and Augmented Reality in Medical Education, 2017, DOI: 10.5772/intechopen.71963
Harnessing the power of artificial intelligence to drive innovation in medical education

AUTHOR(S):
- Awais Sheikh, Dudley Group of Hospitals, UK (Presenter)
- Reeja Adel, Dudley Group of Hospitals, UK

ABSTRACT

Background: Artificial intelligence (AI) is threatening to revolutionise the way that healthcare is organised and delivered as part of the modern NHS. The technology has seen a number of applications, from detecting early melanoma to reporting chest radiographs with impressive levels of accuracy. It would therefore seem plausible that AI will play a significant role in medical education, as we come to grips with its potential to enhance knowledge acquisition, decision making and psychomotor skills.

Aims: We propose the use of a custom ‘chat-bot’ as a tool to enhance history taking, communication and decision-making skills as part an interactive learning package.

Methods: We developed our chat bot using Microsoft QnA Maker™ with the Azure bot service ™ providing the back end. The database was pre-programmed using detailed scripts and phrases in order to reflect a realistic patient encounter. The bot was trained by using multiple phrase variations in order to anticipate potential user inputs and allow natural flow of conversation. The bot was packaged within an interactive learning resource, using images and videos to simulate the whole process of a clinical encounter from history and examination all the way through to differential diagnosis and management. The package was designed to be available to students on-demand across a range of platforms in order to encourage use.

Results: Prospective data would be collected before, during and after the interaction with our learning package in order to assess confidence with the given clinical presentation, test ability to gather information and understanding of the case. Qualitative data would also be gathered about accessibility, ease of use and perceived usefulness of the bot as a learning tool.

Discussion: We propose that artificial intelligence could be used to design increasingly sophisticated clinical encounters which can cheaply and quickly emulate any number of conditions to meet the learning needs of a particular group. This could supplement existing learning materials and be used on demand by students to develop and consolidate knowledge in problem areas. Crucially, the technology can provide exposure to rare but clinically important conditions within a safe environment.