



Education Day 2017 Proceedings

# **Transformational Education: Learning for Life**

Editors: Roberto Di Napoli with Elizabeth Miles, Judith Ibison and David Oliveira

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## A note of thanks

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These proceedings are dedicated to Elizabeth Miles, who initiated the series a few years back, along with many other initiatives at St. George's.

Roberto Di Napoli

July 2018



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# St. George's, University of London: Transformation at Heart

*Roberto Di Napoli*

St. George's is on a transformational journey. Transformation, as both a concept and a guiding principle, is at the heart of our Education and Students strategy (2017-2022) which states, first and foremost, that the University aims to 'transform the lives of those engaged in our education and prepare graduates well for their future careers' (2017). Here, transformation is construed to be the constructive, agentic force that underpins, traverses and supports positive change in and through the lives of all of those involved in the education process, be they students, academics or professional staff. In this sense, transformation drives and binds together the intentions, aims and purposes of those studying and working in the institution, while ultimately focusing institutional efforts on students' preparedness for work and employment. Preparing students for work is naturally central to the concerns and ethos of a professionally-oriented organisation such as St. George's. However, work-preparedness is by no means the main institutional aim. The latter is transforming people's lives in positive and forward-looking ways.

Whether intentionally or not, the transformative educational underpinnings at St. George's reflect well the ideas of one of the most important contemporary educationalists, Jack Mezirow, whose name and work fall into a noble tradition of past and present educationalists equally concerned with transformation (Dewey, Vygotsky, Montessori, Freire, Bruner, Barnett, Brookfield, Meyer and Land, Lave and Wenger, to mention just a few). Mezirow (1978), for the first time, proposed the idea of transformative learning as the meaning making process through which students interpret new situations and contexts by reflecting constructively on their past and current knowledge, experiences and assumptions, as they move towards future action. For Mezirow, transformation is the glue that connects past, present and future learning in the formation of new personal and professional perspectives through which to act *in* and *on* the world. Transformation becomes a force for positive change which is intellectual, affective, practical and creative at the same time, but never only instrumental. A truly transformational education cannot limit itself to instrumentality, as it concerns the critical growth of minds, knowledge and the personal and professional identities of all those involved in the educative process. Consequently, it requires the

investigation and integration (not homogenisation!) of multiple disciplinary, interdisciplinary, professional and interprofessional horizons.

Because of this, an education that is truly transformational sits uncomfortably with those reductionist views which try to link the purpose of the university (and higher education) to sheer preparedness for the world of work. Whilst this is certainly a legitimate aim, work-readiness cannot be the sole, naked aim of higher education. As Barnett (1997) reminds us, the latter is a critical business whose aim is to transform people and their contexts for the ultimate good of the world in which we live. Being work-ready may be part of this but it cannot be the driving force of a scholarly, inquiry-led and research-focussed institution such as St. George's. Instead, it is the scholarly transformation of minds, hearts, knowledge and professions which drives our mission. This requires many joined-up efforts, a passion for learning and discovery, and a drop of utopia, without which positive and significant transformation can never really happen.

Because of its centrality in the Education Strategy, the powerful word 'transformation' was the focus of St. George's Education Day, held in November 2017. This collection presents the efforts of those who actively participated in the conference to ponder on the meanings they ascribe to the concept of transformation in relation to their educational practice. The result is a rich panoply of interpretations and narratives that sheds light on the ongoing efforts made by many of us at St. George's towards forms of transformational education. We are not 'there' yet, nor is what we do 'perfect', nor perhaps should we think of transformation in terms of 'perfection'. This is because transformation is not necessarily a goal to be reached. Instead, it is a reflective, critical and creative tension that we need to nurture in ourselves and our students in relation to those changes and challenges (professional, political, personal, moral) that life throws at us every day. In this sense, transformation is indeed synonymous with learning for and throughout life.

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# Part 1

## Insights

# 1. Transformation & the St. George's Education and Students Strategy

*Jane Saffell*

For more than a year we have been developing a new strategy for St. George's, culminating in the launch of the Strategic Plan 2017-2021. The education community had the challenge of creating a strategy for the Education and Students strand that would embody the values, spirit and philosophy of our university. The detail can be seen in the published plan, but the strategy for education and students is distilled into the theme 'Transformative education, in partnership'.

So, what is transformative education? Is our education at St. George's transformative? How can we illustrate this? How would we recognise whether our graduates had been transformed in the ways we might hope? Recognising the necessity of involving the wider St. George's community in answering these questions, I suggested at an Education Day planning meeting that we have transformative education as the theme for 2017, and am delighted that this has come to pass.

The immersion in practice that is a feature of a St. George's programmes is an obvious example of our transformative education. Students are given legitimate access to participate in practice, whether this be in a clinical or laboratory setting (Lave & Wenger, 1991); they are given opportunities to acquire dispositions and qualities, to progress from 'knowing' and 'acting' to 'being' and 'becoming' a certain type of person (Barnett, 2009), while developing the ways of thinking and practicing in a discipline (Hounsell et al., 2005).

Transformative education is at the heart of the strategic plan for education and students but the challenge is for this to be the lived experience of the education community. It means being integrated in a scholarly community of students and staff, with curricula that immerse students in practice and a culture of student-staff partnership. It means authenticity - programmes (undergraduate, postgraduate and professional) that align with our strengths, who we are and what we do, and having thoughtful assessment aligned with practice. It means fostering an educational and learning development culture in the service of high-quality, inspiring teaching and learning for all students, strengthening educational research and scholarship and nurturing educational innovation.

This Education Day opens up to the St. George's community the question of what transformative education means for us. It provides opportunities to both share the ways in which we embody it and explore how it can be enriched and developed so that 'Transformative education, in partnership' is indeed the hallmark of St. George's.

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## 2. A Critical Introduction

*Johan Geertsema*

Following on from St. George's successful 2017 Education Day on the theme of transformative education, these proceedings consist of a wide-ranging and very rich collection of contributions. It includes informative, scholarly studies that report on workshops presented at the event; investigations of aspects of practice; accounts of attempts to enhance it through CPD, new or redesigned courses and educational technology; and concludes with a set of reflections on posters through which learning, research, and teaching - and the transformative potential of connecting and integrating them - were shared on the day.

The proceedings are nicely framed by an interview with Linda Price and a reflection by Jane Saffell on transformation as key to St. George's education strategy. Price drills down into thinking what the relation might be between *change* and *transformation*. She makes the important point that change is not always positive, whereas transformation would mean doing things differently *and* better (improvement). Higher education is undergoing huge changes at present and in the UK government policy increasingly sees its purpose as instrumental in economic terms: 'to facilitate the needs of the economy' (p. 23) and ensure employability. This pressure is apparent everywhere in higher education now, as funding formulas are changed - also in Singapore - to align with industry needs, more and more universities are being compelled to move into adult education and turn themselves into skills-focused, vocational institutions, while maintaining a focus on research and undergraduate education.

However, single-minded emphasis on economic imperatives and employability overlooks a crucial aspect of higher education, namely its *developmental* role, in particular, 'helping students develop social and cultural capital' (p. 24). The insistence on metrics to ensure predetermined economic outcomes tends to mean hard-to-quantify, yet 'really important and valuable things that we bring, as educators' (p. 24) to higher education are overlooked, in particular helping people to think differently, and to challenge their beliefs and assumptions. If we do not pay attention to what is valuable, to *values*, education becomes just the transmission of a collection of facts; a negative transformation, globally, of education into something purely instrumental. Price forcefully makes the point that education does not work

like a factory, in which ideas are poured into heads on a conveyer belt, then out the students come the other end. Instead, they need to learn to challenge notions around knowledge. Consequently, transformation means ‘enabling students to construct and deconstruct ideas and then reconstruct them’ (p. 25). Educational technology has the potential to assist with this by increasing collaboration, but good use of such technology requires good staff development. Ultimately, integrating technology and education has the potential to enrich student learning through, for example, authentic assessment in the case of engineering or medicine.

An illustration of the importance of learning through inquiry is Spiller’s focus on the transformational process of moving from being a pre-clinical medical student, to practising as a doctor in a clinical environment, and the role of ‘Preparation for Medicine’ sessions to support the development of attitudes, behaviours and practices. She considers how clinical reasoning and dealing with uncertainty require *learning how to learn*, because of the imperative of embracing uncertainty in the complex messiness of practice. Ultimately, what is required to facilitate this important transition to ‘get our medical students thinking and acting like doctor’ (p. 49) is a critical, inquiry-like orientation that helps students move away from the idea that there will always be a clear-cut answer to medical problems. It is important to challenge the ‘reductionist black-and-whiteness’ (p. 52) of medicine that pre-clinical academic medicine can leave students with, and instead to get students to reflect and learn within a rich clinical environment.

A series of reports then follow that focus on educational technology, and its role in transformative education. In reporting on their workshop, which considered the reasons for introducing the Canvas LMS at St. George’s and its transformative potential, Dickerson, Dixon & Williams usefully distinguish between the meanings of ‘transforming’ and ‘transformational’, pointing out that the former will result in the latter only if there is a change in ‘output, impact or results’ (p. 54). This connects with Linda Price’s point about the link between transformation and improvement. They further importantly point out that changes in educational technology do not necessarily result in educational transformation, a point also made in Woodham et al.’s report on their workshop, which focused on MOOCs. After considering some of the potential advantages of MOOCs for increasing levels of student engagement and promoting active learning, they turn to questions as to the degree to which MOOCs can be effective in medical education, e.g. by catering to the needs of the clinical workforce, in particular with reference to CPD. While MOOCs provide the possibility of transformational education, the precondition is that ‘they must be well-designed, based

around sound pedagogic principles' (p. 37) and in addition, have 'support from subject-matter experts with sufficient time and understanding of how they can be well-used' (p. 37).

Tatton-Brown's likewise considers MOOCs. She describes the development of a suite of courses in the growing area of genomics as part of flexible CPD and credentialing, drawing on the affordances of MOOCs within the parameters of an argument for educational transformation to engage and retain students. Another example of the transformative use of technology at St. George's is described by O'Callaghan, Threapleton, and Khong in their report on a survey of simulation-based education (SBE) at St. George's satellite sites. They argue that SBE has the strong potential of effecting fundamental change in the thoughts, values and feelings that frame medical students' experience of the world through replicating scenarios.

It is wonderful to see some student voices included in these proceedings. Zargarán and his colleagues report on 'Connect', a student-led digital platform with the goal of bringing the worlds of research and learning closer together. 'Connect' provides research teams outside of the dedicated SSC block with a workforce consisting of undergraduate students, while adding value to the student community in providing research opportunities.

The proceedings conclude with reflections on other contributions made, including a series of posters and a PechaKucha presented at the Education Day. In her conceptual poster Khan, like Zargarán, focuses on connecting research and learning, in this case through quality improvement projects that 'push a learner to transform by developing more than basic research skills' (p. 82) such as team work, financial issues, and practice development, 'key skills for tomorrow's doctors' (p. 82). Jivram et al. focus on the important issue of medical error. The TAME (Training Against Medical Error) project involves learning through error by using interactive Virtual Patients (VPs) in the St. George's Problem-Based Learning (PBL) curriculum, an innovation that has been taken by the team to such countries as Kazakhstan, Ukraine and Vietnam. The authors discuss how curriculum can be transformed to include interactive online VP PBL cases to teach against medical error. In his PechaKucha, Round likewise focused on error, presenting a historical taxonomy of errors with examples of each: ignorance of error, denial of evidence, personal blame, and a concept of systems preventing or promoting error. The latter 'sees medical error as inevitable, but patient harm as avoidable' (p. 74), as he nicely puts it. Round points out that error is as old as clinical medicine itself, and that understanding how it happens is crucial for improvement of practice.

The poster by Hill and Hudson, a student-clinician partnership, presented an audit that sought to evaluate the impact of changes on the quality of service delivered to patients being transported by air ambulance. In their poster on their use of 'Dragon's Den', Pearson and Thomas placed medicine into a wider context, so students can see that,

'death, disease and disability are not caused or treated solely by medical and nursing services but that there are environmental, social, political and economic factors' (p. 84)

Wason, Whiting, Arrigoni and Clarke presented an interdisciplinary international research collaboration on critical thinking through three posters. Finally, Day and Thomas, in their poster, presented research on gender issues in medical education. The poster focused on the first four women who trained at St George's in 1915, tracing the history of how St. George's has over time been transformed into a much more diverse and inclusive institution. In the reflection they consider the implication of their research for such contemporary issues as medical workforce retention, as well as the need for greater flexibility in relation to work-life balance.

Overall, it is striking how much the various topics above resonate with those we discuss at my own institution, the National University of Singapore, despite significant differences in context that mean the challenges and opportunities are articulated differently. Whether the focus is on connecting students with research opportunities; fostering critical thinking; using Massive Open Online Courses (MOOCs) for CPD or as a means of enhancing undergraduate education; developing SBE within the context of interprofessional education; maximizing the affordances of virtual learning environments; or ensuring inclusivity and diversity - these are issues that are alive in higher education institutions across the world today. What connects all of the contributions in this volume, and results in a coherent focus across different topics, is the combined emphasis on *transformation* and thinking through what a truly *transformative education* might mean today, in the particular context of St. George's.

### 3. Interview with Professor Linda Price, Keynote Speaker

*Linda Price and Roberto Di Napoli*

**Roberto Di Napoli** Thank you for coming to our Education Day, Linda. My first question is: how did you find the Education Day? Did it address the issue of transformational education well? Was it a worthwhile experience for you?

**Linda Price** It was a very worthwhile experience for me. A really memorable day and there were lots of things that I took away from it. I think the first thing that was really striking was the way in which theory was helping to drive practice, in particular to inform the strategy of the institution. When Jane Saffell was giving her talk, the way that she drew on the literature and the research and made that into a very informed strategy and pedagogy was great. I also really enjoyed your talk. I felt it really informed the day in terms of the concept of transformation and it was really so nicely underpinned by relevant literature that was taken right across into teaching and learning, transformation and so on. So I thought that was really great. I was also really struck by the way in which one of the staff was actually using MOOCS to really get across staff development issues around Genome development and research (which will impact upon practice significantly). So, it was a really very interesting day for me and I thoroughly enjoyed it. So thank you for inviting me.

**Roberto Di Napoli** It was our pleasure. As you rightly pointed out, one thing which was very much at the heart of the day was, as you rightly pointed out, the relationship between theory and practice. If we leave, for now, higher education aside and we consider the words 'change' and 'transformation', what do you consider them to be like? What is 'change' and what is 'transformation'? Are they synonymous or are they different things for you?

**Linda Price** No. Change is something that one can do without actually making a difference. So, one can change something, but it might not actually transform it. Transformation is about changing the form or the nature of something in a way that makes it, in my mind, for the better. That is, transformation is something that is different in nature and improved.

**Roberto Di Napoli** Ok, so there is a difference in terms of transformation being stronger, if you like, than change?

**Linda Price** Yes. Well it's an added value. One can make a change and sometimes it's actually for the detriment, especially for teaching and learning, rather than the improvement. So, transformation required thinking about how one improves or makes better a particular thing or situation.

**Roberto Di Napoli** This is all very interesting. What are the features of transformation?

**Linda Price** Ah. Ok. This is something that we actually looked at on the day which was really quite interesting and lots of people were focusing on it. I think there are probably two things for me that characterise that. It's a change in nature and a change in form, so to speak. So there's something about the nature of this transformation that's different, and something about the form that's actually quite different as well. So it required thinking about how we do things differently and how we do things better.

**Roberto Di Napoli** Let's leave transformation aside for the moment, we'll link it up to higher education later on. Coming to higher education, what do you think this is for you today? Higher education is changing dramatically - what are its purposes and also opportunities and challenges today?

**Linda Price** Well, I think you've hit upon a very crucial question in higher education right now and that is what are the purposes of higher education? One of my concerns is that, certainly within the UK, a government agenda which is about making the purpose of higher education to facilitate the needs of the economy. So it makes a university degree an

instrumental act in the sense that the value of higher education is solely to gain employment. And I think there is a problem with that notion of higher education, because it overlooks all of the other important things in society. An educated society is a good society because it's knowledgeable and not just in terms of economic value. There is value in helping students develop social and cultural capital, and it's about getting people to think about things in a different way. This builds a better and more developmental society that goes beyond a capitalist agenda where value is considered more widely. It's not just about making a few more pennies. So I think that's a really crucial question right now as to what higher education is actually about and for. And I think all of these metrics that we have right now just overlook some of the really important and valuable things that we bring, as educators, to higher education such as enabling people to develop and enabling society to develop.

**Roberto Di Napoli** And so that's what is transformative about education for you?

**Linda Price** Yes, that is what is transformative about education. Getting people to think differently and in a sense, challenge their own thoughts and beliefs about particular things. Because if we don't, it's just an accumulation of facts. And I don't think that's education at all.

**Roberto Di Napoli** No. Even though now the tendency all over the world is to transform education into something which is very instrumental.

**Linda Price** Correct. And I think in higher education we have to hang on to those values. Because when you think about it historically, universities have been very important for changing thinking and ways of doing things over the years. We've always been under threat. When you think of aggressive regimes across the world over the years, when they want to take control, the first thing they do is they close down universities. Because ideas are important and powerful for changing how we think and how we behave. You can kill many things, but it's harder to kill ideas.

**Roberto Di Napoli** Yes, you can't. Indeed, you can't.

**Linda Price** [laughs]

**Roberto Di Napoli** Alright, on this note of optimism, if we talk about transformation in our education, what are we transforming? And who are we transforming? And why and how? So let's start with what and who. If we talk about transformation, what do we transform? And who do we transform?

**Linda Price** Well, are you talking about aspirations or what we're currently doing?

**Roberto Di Napoli** Perhaps we can start from the bare reality and then we can talk about aspirations.

**Linda Price** I think that's variable across different parts of different universities. I think certainly, in the university that I work in - it's a widening participation university - so, the things that I try to do in terms of rolling things out or in terms of trying to develop stuff, is to actually support academics in helping young people to transform their lives. So, if you've got a widening participation agenda, you've got students who maybe don't have a lot of social and cultural capital because their parents haven't gone to university, because they're from poorer backgrounds. So, transformation for them is taking where they've come from and enabling them to think and act differently. The difficulty with that is, is that you need a lot of supporting mechanisms around that. So, in order to help students transform their lives, we have to help staff help the students transform. And one of the problems is that I think we're stuck in this rather archaic view of higher education, which is a little bit like, 'bring them in, pour some knowledge into their heads and shove them out the other side of the factory' and I think we have to get beyond that. We have to get them involved in critical thinking, deep thinking and challenging things and sometimes being disrupted and disruptive - not in an aggressive sense - but in a sense where they're challenging notions around the knowledge and 'what does it mean' and so on. So, for me, that is what transformation is all about: Enabling students to construct and deconstruct ideas and then reconstruct them.

**Roberto Di Napoli** Yes, this all makes extremely good sense. And how do you see technology playing its part in this?

**Linda Price** Well, it's certainly not the lead. It has to follow. It has to enable these things to happen. And technology will not enable those things in and of itself. It has to be us, as educators, that uses that technology to transform and help transform situations. I do think it has a key role to play. I think this notion of herding students into a lecture theatre and thinking that we can just act as the 'sage on the stage', those days are largely over. It's not to say we don't have a place, or it's not to say that face to face hasn't value, of course, it has tremendous value. But the speed at which things are happening and the distribution of society is changing, so we have to facilitate lots of those things. So, for example, I think we have to construct situations where students are trained to get information and to be discerning about that information. They need opportunities to be able to use some of those tools to construct things in collaborative ways, to discuss things on SKYPE, (such as we are doing right now), and to enable critical thinking and communication. The need is to very much to build around that discussion and that collaboration and the construction of ideas.

**Roberto Di Napoli** And the challenging of those ideas as you were saying before.

**Linda Price** And the challenging of those ideas. Very much so.

**Roberto Di Napoli** And even understand that knowledge is not just about statements, it's about questioning things.

**Linda Price** It's definitely about questioning things.

**Roberto Di Napoli** So, how, and to what extent do you think technology can help to transform higher education?

**Linda Price** Well I think that goes hand in hand in with really good development of staff and enabling them to think differently in their practices. The

technology itself isn't going to do it. It's about how we, as educators, use it. And that requires us to be really quite savvy also about how things are changing in society and, for example, how we go about developing authentic assessment practices. Just giving a student a piece of assessment because it's easy for us or it's because what we've been used to doing that way, is not necessarily to their value or to their development. So for example, let's take engineering as a subject, and let's just say someone is trying to figure out what's wrong with a particular piece of machinery and how they go about fixing that. Historically they might have been asked to write a report on that or they might have been asked to draw a plan as part of an assessment. In actual fact what they're doing is industry now is different. They are taking short videos of issues and then writing about three critical things that need to be addressed. So, when we're thinking about assessment, we need to think about what's practical and reasonable and what's helpful in that domain in the real world. Similarly, medical education, we've had a tendency in the past to be developing specialisms separately. But there's a greater requirement now, given all of the complexity in medicine and other areas, to be thinking more systematically; thinking more holistically, so that specialisms and different practitioners are working seamlessly and holistically together. But yet, we're assessing people individually – still, and often on things they have learned rote.

**Roberto Di Napoli** And can technology help with that?

**Linda Price** Yes, I believe it can. Let me give you an example. One of my PhD students has recently just written up her thesis and her area was looking at how technology can facilitate some of these particular areas - she's working in the area of pharmacology. One example of what they've done is they've set up a virtual reality world, where, the student or some of the teaching staff are put into groups and they're acting out different role-playing situations. So, the difference there is, that in a face to face situation, you know who the teacher is, even if you're role playing, and sometimes if you put students into groups by themselves, the degree to which they act out the reality of the

complexity of the situation changes because they know they're dealing with students. In a virtual reality world they don't know who's who because everyone's anonymous and they have an avatar, a pretend person, so the degree to which they act out real situations is really enhanced. The students have found that VR environment more challenging to act our role play, which is important in order simulate real world situation and be able to be trained and developed in handling critical situations. So, this is an example of how we can use technology to act out and give them practice of real life situations authentically, without any damage to patients.

**Roberto Di Napoli** Ok, That's great. One last question. Do you think that technology is changing our education, or do you think that trends in our education are changing technology?

**Linda Price** Now that's an interesting question. If you'd asked me that question, probably a few years ago I would have said that in order to change things in our education one has to have well developed and supportive staff. But I have come to believe that certainly the pressures of the technology are pushing back and are forcing us to think a little bit differently. I don't think we can carry on in higher education doing things the way we have done historically because I think there are so many changes that technology has brought to society whether we like it or not, such as the plethora of information that's out there. So, it is, I think, forcing us to think about how we develop discernment skills in our students, how we get them to be discerning about what information they use, how they value it, what information they actually put out on the internet, how they're careful about that as well. So, I think it's a little bit of yin and yang. I think there's a push back that is making us rethink a number of things. But also, we have to have staff that are thinking about things differently.

**Roberto di Napoli** Thank you, Linda. Any final thoughts?

**Linda Price** Yes, I just have to say, of all the conferences I've been to and all the events I've been to, this one was the one where I have not just

enjoyed all the sessions, but actually really learned so many different things. And every session was just so engaging. I didn't want the day to end. So, you've got great colleagues who are coming to these things and great framing around what you're doing and I think it's the envy of many universities to be honest.

**Roberto Di Napoli** Ah, thank you very much Linda.

**Linda Price** You are welcome.

# Part 2

## Sharing Expertise

# Introduction

*Elizabeth Miles*

This section brings together five pieces arising from workshops and short presentations which address approaches to transformational education in practice. The pieces extend across the spectrum of learners – students, healthcare professionals and university staff – and of learning environments, notably classroom, workplace, simulated and virtual. Four of the contributions identify the transformational potential of technology-enhanced learning both for individual study and incorporated into programmes and flexible frameworks, although the challenges of achieving this potential are also addressed. All five pieces are forward-looking, proposing changes to practice that could highlight and promote transformational learning.

Woodham and colleagues outline the rise of the MOOC (Massive Open Online Course) and its potential value in transforming the way in which learning is enabled and supported. Of particular note is the extensive range of learners that can engage with and benefit from the format. Their workshop explored the potential applications of MOOCs in healthcare education both in formal courses and for staff undertaking CPD (Continuing Professional Development). The ever-present danger of CPD becoming fragmented and perfunctory can be minimised in MOOCs with their potential for individuals to control the nature and pace of their learning whilst remaining part of an education community. Ensuring a high-quality learning experience depends on the collaboration of subject-matter, pedagogical and technological experts.

Tatton-Brown is a Consultant in Genomic Medicine and has been central to the development of St George's MOOCs and postgraduate courses in genomic medicine. In her article, Tatton-Brown sets out a proposal for a flexible framework to facilitate widening access to postgraduate education. Online provision including MOOCs and learning resources is combined with face-to-face teaching in workplaces and universities and exemplifies transformational education through its support of individuals in making choices about ways of learning and the nature of their professional development.

O'Callaghan, Threapleton and Khong present the results of their survey of the use of Simulation-based Education (SBE) across satellite placement sites for St George's medical students. They highlight the opportunities for transformational learning offered by SBE,

particularly the development of professional skills through facilitated reflective discussion following exposure of students (in a safe environment) to challenging scenarios. High-fidelity SBE allows students at a relatively early stage of their medicine course to make decisions on patient care and management in complex situations and to experience directly the consequences of their decisions. Of particular transformational value is the development of skills in team working, especially so in interprofessional scenarios.

Spiller identifies a key point in the transition of medical students into healthcare professionals and asks how we might challenge our students in a supportive environment to embrace uncertainty and recognise that medical practice is not a series of clearly defined, easily solved detective cases. Spiller describes the development of the complex process of diagnostic reasoning which is promoted through sessions in which students are facilitated to identify and employ the key features of patient clerkings necessary for diagnosis. She emphasises that a key element of the transformational process is that of students learning how to learn.

Dickerson, Dixon and Williams alert the reader to the various usages of the term 'transformational' and address the potential opportunities and challenges of 'disruptive pedagogies' when introduced to an institution. Their account of the introduction of a new virtual learning environment to St George's is both pedagogically and pragmatically informative and stimulating.

## 4. Making MOOCs in medicine and healthcare

*Luke Woodham, Kate Tatton-Brown, Fiona Howat, Sheetal Kavia, Trupti Jivram, Aurora Sesé Hernandez, Supriya Krishnan, Ella Poulton, Kavirthana Krishnamoorthy, Terry Poulton*

### Abstract

MOOCs (Massive Open Online Courses) have become an increasingly widely used tool within medical and healthcare education. They offer the possibility for delivering educational transformation in terms of both levels of engagement and the geographic, professional and social diversity of learners. This workshop, which took place on St George's, University of London Education Day 2017, aimed to provide both faculty and student participants with an introduction to the ways in which these tools can be used to develop innovative and engaging learning experiences, of benefit to learners both inside and outside the classroom at varying stages of medical and healthcare training and practice.

### Keywords

MOOCs; technology enhanced learning; innovation in education

### Background

The profile of MOOCs (Massive Open Online Courses) has grown significantly in recent years, with a great number of academic institutions developing their own courses. MOOCs are free-to-enrol online courses that provide a unique ability to offer teaching at a massive scale, with learner cohorts ranging in numbers from hundreds to hundreds of thousands. The pace of change is rapid; at the end of 2013, only 25 MOOCs had been run in the UK (Bayne & Ross, 2014), while a recent report indicated that worldwide, at the close of 2017, there were a total of 78 million people registered on MOOC platforms. More than 9,400 MOOC courses are now available, delivered by more than 800 universities worldwide (Shah, 2018a). At the heart of this widespread adoption is a belief that technology-enhanced learning resources and activities have a key role to play in educational transformation. In particular, MOOCs have the potential, when used effectively, not only to transform the delivery of learning, making use of approaches such as flipped classroom, blended learning, or fully online courses, but also to evolve the identity of learners and the ability of academic institutions to reach them. Well-designed learning activities using technology can increase levels of engagement, both offline and online, promoting active learning, improving

performance and even encouraging greater attendance at on-campus lectures (Prober & Heath, 2012).

Within medicine and healthcare, there have long been questions and contrasting views about how effectively MOOCs can cater to the needs of the clinical workforce (Davies, 2013). Limited provision for assessment and thus evidence for their impact on learners, as well as the orthodoxy of tradition, represent barriers to their acceptance (Harder, 2014). However, as the collective understanding of how to maximise the impact and utility of MOOCs has matured there has been a particular focus on their use for Continuing Professional Development (CPD) by existing healthcare practitioners (Bryson, 2017; Shah, 2017). This represents an opportunity for academic institutions to reach a large group of potential learners that are heavily invested in developing and updating the skills needed in the workplace (and indeed are often mandated to do so by their professional regulatory body) but who do not have the time available to enrol in conventional face-to-face taught courses. Amid talk of a growing global skills gap, and when universities face regular criticism for failing to meet the needs of the workplace, MOOCs provide a powerful argument for their inclusion as a key tool in addressing these challenges. Already, MOOCs have demonstrated their value in addressing a training shortfall in the response to the 2014-15 Ebola epidemic (Evans, Luffy, Parisi, & del Rio, 2017). Given the recent increased focus on MOOCs for corporate learning (Shah, 2018b), we might also anticipate closer partnership between business and universities in future, developing courses exactly aligned to workplace expectations.

St George's, University of London (SGUL) have created a number of MOOCs using the FutureLearn platform (FutureLearn, n.d.), which places a strong emphasis on social learning and the use of online peer discussion to foster engagement. This approach seeks to build upon a key advantage offered by MOOC technology; as a result of their content being freely available online, MOOCs are available to learners regardless of their prior experience, resources, geographical location, or any affiliation with an academic institution. This encourages a diversity amongst learners in a MOOC learner cohort, allowing learning activities that encourage peer discussion within a MOOC resource to provide a unique range of global and inter-professional perspectives. Within medicine and healthcare, the possibility of having patients and their families included amongst the learner group offers a valuable opportunity for health practitioners to hear directly about their experiences, as well as a means for a widespread programme of patient education and improving public health literacy (Goldberg & Crocombe, 2017).

## Session Aims

We ran a workshop during St George's, University of London Education Day 2017 with the aim of providing an introduction to MOOCs, and to give participants the opportunity to consider how such resources could be useful in their own field and/or teaching. The workshop was designed to be suitable for anybody involved in education, whether a teacher, researcher or student. The stated learning outcomes were that participants should be able to: describe a MOOC, and consider the benefits and challenges that come with delivering learning resources online; identify how they could get involved in creating a MOOC themselves; and produce a proposal for a MOOC in an area of their choosing, identifying the target audience and the unique selling point for that course.

To that end, the workshop introduced the key concepts, and was then primarily built around a group reflection and discussion on how the use of MOOCs, and technology enhanced learning resources more generally, could address educational challenges. This was supported by a presentation from a clinical educator with experience of creating several MOOCs. The aim was to conclude with a group activity in which participants could begin planning a MOOC proposal that would address a challenge in their own field.

## Reflection on engagement with the audience

The workshop motivated a great deal of discussion amongst participants. Those present had varying levels of experience with MOOCs; while some had created their own courses, others had enrolled as students in courses, and others were entirely new to the concept. All were involved in education in some capacity, predominantly as staff. To guide the discussion, participants were asked to consider two key questions:

1. How could delivering material through MOOCs or online courses address some of the challenges faced or opportunities presented in education today?
2. What would you need from a course to be able to deliver it online?

Participants had a short period to discuss in small groups, and then reported back their thoughts in a whole group discussion. Several common themes emerged from each of the groups. There was a widespread focus on the potential benefits for students, and in particular the flexibility in terms of time and location provided by online learning. Similarly, several groups commented on the potential to 'widen the net' for learning, giving greater numbers of students globally and across social boundaries access to learning materials, as well as making materials accessible to those with specific support needs. There was a

consensus that the learning provided could be high quality and offer opportunities for pedagogic innovation, using techniques such as flipped classroom and blended learning as a 'better use of small group time', and that hearing 'patient experience first-hand' was of great educational value. While the pressing need for assessment models to mature in order to harness the potential of MOOCs as resources for developing and certifying expertise was noted, it was commented that this would also reduce a tendency to learn-to-test.

The second part of the workshop was a presentation and further discussion with a clinical academic who had experience of creating multiple MOOC courses targeted at both existing healthcare professionals and postgraduate level students. Hearing from a peer was crucial for the participants to get a true picture of the challenges and benefits of creating a MOOC course, and this provided a forum for the discussion to focus on the practical challenges of creating a MOOC, and strategies to overcome these, including the potential to apply for funding to back-fill the time needed to develop the resource. This is often not feasible, but by applying for funding where it has been made available to address a specific need or knowledge-gap in the clinical workplace, it is possible to ensure that the developed course is closely aligned to addressing that need and being of significant impact. There were understandably concerns raised about the demands on time and resources that creating MOOCs requires; the time effort for developing a course is substantial. However, participants acknowledged that beyond the initial development period, the re-use value of the learning resource meant that there was long-term potential to free up valuable staff time. A key goal for the workshop was to share this message, since subject-matter expert time and commitment is essential to achieving the desired outcome of a high-quality and well-designed learning resource.

## Conclusions

MOOCs provide a unique opportunity for universities to transform their educational offerings. They can enhance the delivery of on-campus teaching through blended learning activities, while making high quality educational resources available to a wider and more diverse pool of learners than could otherwise be reached. However, in order to achieve this, they must be well-designed, based around sound pedagogic principles, and have support from subject-matter experts with sufficient time and understanding of how they can be well-used.

Our workshop demonstrated that there is a generally held understanding and acceptance that MOOCs represent an opportunity to develop new, high quality learning experiences. By

engaging subject-matter experts with the experience of working with MOOCs, we can seek to expand this understanding and promote uptake of these resources.

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## 5. Genomic medicine and a flexible curriculum

*Kate Tatton-Brown*

### Abstract

Powerful new technologies are transforming how we deliver healthcare with faster, cheaper generation of genomic data increasingly informing rapid diagnosis and personalised treatment of disease. At St. George's, we have developed a portfolio of genomics educational resources (with three Massive Open Online Courses (MOOCs), a postgraduate certificate (PgCert ICAG) and an MSc in Clinical Genomics) to prepare the healthcare workforce for a genomics-based healthcare system. These genomic resources exemplify a transformational, flexible approach to postgraduate learning with the inclusion of online, accessible resources, and the facility to undertake sequential modules to assemble a bespoke programme of postgraduate learning: the MOOCs provide the module 1 learning for the PgCert ICAG which, in turn, can be extended to the MSc Clinical Genomics. Extensive work is underway at St. George's to develop this flexible postgraduate portfolio with the creation of a broader suite of online and face-to-face teaching resources as well as the logistical framework to deliver this transformational curriculum.

### Keywords

Curriculum; genomics; flexible learning; incremental learning; postgraduate

### Background

The last fifty years have witnessed unprecedented advances in technologies transforming how we communicate, access data and structure our lives. We have become a 'Netflix' society with the facility to choose what we want, how we want it and when we want it. However, in contrast to the enormous changes which define modern society, our methods to teach and educate largely remain unchanged with rigid curricula, delivered through didactic, outdated lectures with limited student interaction or engagement. Therefore, if we are to engage and retain students, it is essential that we critically evaluate our teaching methods, consider how technologies could be harnessed to improve the learning experience and implement a marked change in form, nature and appearance. In other words, we need educational transformation.

A flexible postgraduate curriculum is an aspirational framework that facilitates access to level 7 postgraduate learning. It aims to deliver bespoke, easily accessible modular education to professionals working in healthcare/health-related sciences with modules chosen and combined to reflect learning interests and requirements. Whilst some modules would still be taught face-to-face, others would be delivered online with consecutive modules undertaken in a “pay as you go” approach allowing the step-wise attainment of higher degrees (figure 1).



**Figure 1: Postgraduate learning delivered through a ‘pay as you go’ model**

At St George’s, University of London (SGUL) we have been developing a suite of face-to-face and online genomics resources that exemplify a flexible, innovative approach to delivering a postgraduate curriculum. Genomics is particularly well suited to a flexible educational delivery given large swathes of the healthcare workforce currently know very little about genomics but will need to develop a fundamental understanding, and very quickly: powerful new technologies (known collectively as next generation sequencing), have recently emerged that provide faster, cheaper sequencing of the entire genome. Data generated by these technologies is increasingly being integrated into routine healthcare to inform diagnosis, treatment and ultimately prevention of disease (Human Genomics Strategy Group).

We have therefore developed a suite of genomics resources to deliver education and training at undergraduate and postgraduate level as well as providing continuing professional development (CPD) for the healthcare workforce. Included amongst these are three online resources delivered through a Massive Open Online Course (MOOC) format, a postgraduate certificate and a Masters in Clinical Genomics.

MOOCs originated in Canada and are a relatively new family of online learning resources that have gained traction as an effective, accessible and flexible tool to engage and teach, particularly the healthcare workforce (Daniel, 2012). At St. George’s we have developed three MOOCs in genomics in collaboration with FutureLearn, an affiliate of the Open

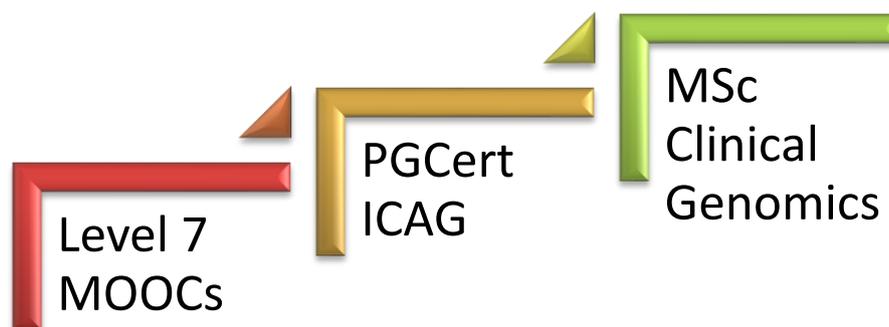
University and the principal MOOC provider in the UK ([www.futurelearn.com](http://www.futurelearn.com)). The FutureLearn MOOC platform is based upon constructivist principles with a heavy emphasis placed on the importance of social learning: at each step learners are encouraged to post, respond and 'like' comments to generate discussion and encourage participation. The first of the genomics MOOCs, 'The Genomics Era: the Future of Genetics in Medicine' provides teaching on the fundamentals of genomics and has, to date, attracted 33,147 joiners and 15,781 learners (the latter defined as participants who declare that they have completed at least one step per week during the course). The other two MOOCs form the 'Genomic Technologies in Clinical Diagnostics' portfolio and deliver postgraduate level 7 teaching on next generation sequencing and additional laboratory techniques used to interrogate the genome.

In addition to being available as online, standalone learning, the two level 7 MOOCs deliver the module 1 teaching for another course; a postgraduate certificate in the Interpretation and Clinical Application of Genomic Data (PgCert ICAG). This course was developed specifically for the specialist genetics workforce and is embedded within the Clinical Genetics training programme. When the course first launched in 2014, it was available to Clinical Geneticists within London, with the entirety of the teaching delivered through face-to-face lectures/workshops. However, the course received overwhelmingly positive feedback and in order to meet national demand, was opened to Clinical Geneticists pan-UK from 2016. We therefore developed a national governance structure and established teaching 'hubs' in Newcastle and Cardiff. However, in order to increase accessibility and therefore engagement, it was essential that we transferred some of the learning to an online format: we used the two postgraduate level 7 MOOCs, supported by a series of expert-facilitated webinars which were held live as well as being recorded and posted to Moodle. This 'flipped classroom' approach ensured all of our PgCert ICAG students had fully understood the MOOC-delivered teaching on a week by week basis and had the opportunity to ask questions (Hamdan et al, 2013).

Although feedback from both the London and national course runs has been very positive and the learning objectives mapped to the skills and knowledge required for leaders of a future genomics-based healthcare system, some students did express an interest in extending their learning to Masters level. At St. George's, we have also established the Health Education England MSc Genomic Medicine (MSc GM), a St. George's, University of London/Kings College London jointly taught course. This course provided the ideal opportunity to establish a hybrid course, consisting of the four PgCert modules, selected modules from the MSc GM and a 60-credit research module tailored to the interests of

Clinical Genetics trainees (i.e. an attachment with Genomics England to analyse data generated by the 100,000 Genomes Project). This hybrid course, the MSc Clinical Genomics, was validated in 2016.

This genomics programme is an exemplar of a flexible postgraduate curriculum; integrating online and face-to-face learning and providing the opportunity to launch postgraduate learning with a single module for CPD but then undertake additional modules until first a postgraduate certificate is achieved and subsequently a masters level degree (figure 2).



**Figure 2: An incremental approach to learning exemplified by a genomics programme**

An additional benefit to a flexible postgraduate curriculum is the opportunity to develop learner-centred bespoke programmes of education, reflecting individual interests and skills encouraging personal development within healthcare specialties. This bespoke approach with the inclusion of online modules (easily accessible, updatable and usually available at a lower fee than is associated with face-to-face modules) also promotes widening participation and student retention, supports students from diverse backgrounds and aligns the programme with one of the cited characteristics of excellent education promoted by the Higher Education Funding Council for England (HEFCE) ‘broad and flexible curricula that are well matched with the aims and objectives and are informed by up to date scholarship and research and, where relevant, consultancy and professional practice’ (HEFCE, 1995).

A number of challenges are associated with the development of a successful bespoke programme however. First, we will need variety in modules – with core cross-speciality modules such as teaching skills, statistics and design thinking and subject-specific modules - to allow for different combinations to be assembled. Second, it will require a flexible

validation process and third, an engaging marketing strategy. Work is underway within St. George's to address these challenges prior to launching an innovative postgraduate programme that will truly transform the education we deliver at St George's.

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## 6. Simulation-based education of MBBS students at satellite sites of St. George's, University of London

*Aaron O'Callaghan, Christopher J.D. Threapleton, Teck Khong*

### Abstract

Simulation-based education (SBE) can provide an excellent opportunity for educational transformation. It can facilitate the development of clinical skills and allow students to learn from their experience through reflective discussion with facilitators and assimilate learning into future practice. We conducted a self-administered, electronic survey in order to examine SBE received by medical students at St George's, University of London, at sites external to the main university campus ('satellite sites'). Five of seven sites responded. Students received a mean total of 4.6 (range: 2-5) SBE sessions per placement, covering an average of 2.6 (1-4) scenarios; and, in groups comprising on average 4.4 (2-7) students per facilitator. Three sites used interprofessional education (IPE) and two sites gave systematic assessments and feedback. An effective SBE strategy may need to consider requirements of quality assurance, standardisation of assessment and support of IPE use more widely in SBE across St. George's satellite sites.

### Keywords

Medical education; simulation; transformation

### Background

Educational transformation is a process whereby learners, through experience and reflection, fundamentally change the thoughts, values and feelings that frame their experience of the world. In this respect, simulation-based education (SBE) can provide an excellent opportunity to facilitate educational transformation in healthcare. It is used as a way of supporting the acquisition of technical skills without exposing patients to risk; replicating scenarios that students are less likely to come across (for example specific acute illnesses); and reproducing team-working including – importantly, between interprofessional groups. It allows students to make decisions, provide patient care and react to consequences of their decision making, when doing so in real life would not be appropriate (Scott-Smith 2014). Thus, SBE can lead to successful transformation by allowing students to

learn from their experience through reflective discussion with facilitators and the assimilation of learning points into future practice.

SBE techniques can be described in terms of the fidelity or realism of the scenarios used. The aim of low-fidelity SBE is to teach students how to perform procedures or simple tasks, without attempting to make the scenario especially realistic; for example, demonstration and practice of venepuncture using a mannequin arm. In contrast, the aim of high-fidelity SBE is to replicate as much as possible a real life scenario and may involve using state-of-the-art mannequins, actors and hospital equipment. Rather than learning step-by-step tasks, high-fidelity SBE aims can provide the opportunity for educational transformation.

Such SBE is increasingly used in medical education. There is now a growing body of evidence supporting its use (Smith *et al.*, 2007), with a recent meta-analysis demonstrating that it is an effective way to learn new skills (Beal *et al.*, 2017). Moreover, the General Medical Council (GMC)'s guidelines on medical education in *Tomorrow's Doctors* (2009) recommends medical schools use SBE to teach undergraduate students. Clearly SBE is increasingly contributing to transforming medical education both in the UK and abroad, and also helping improve students' knowledge and skills. Thus, the Transformational Education themed research day at St. George's provided an important opportunity to assess SBE teaching for students.

Our aim then in this project was to document the particular characteristics of SBE received by medical students at St George's, University of London (SGUL) whilst on placement at clinical sites external to the main hospital campus ('satellite sites').

## Methods

A self-administered, electronic survey was designed to understand various aspects of SBE delivered by respective satellite sites including which MBBS year groups were being taught, the number of sessions offered and various other details such as the type of scenarios covered, student:facilitator ratio, feedback and the use of interprofessional education (IPE). St. George's students are assigned 3 to 5 week placement blocks at 23 satellite sites (including hospitals, GP surgeries and mental health trusts). As the majority of these sites only receive two or three students across all year groups per placement block, the survey was sent to the Educational Deans of the largest sites which received a total of ten or more students per block.

## Results

In total, seven sites were identified and five responses to the survey were returned. Overall, clinical simulation teaching appeared to be a relatively new development, with the majority of sites initiating SBE within the last two years. Sites offered a mean total of 4.6 (range: 2-5) clinical simulation teaching sessions per placement, covering a mean of 2.6 (1-4) scenarios per session. Sites focused on simulation teaching of the senior year groups, with only two sites offering teaching to 3<sup>rd</sup> year students. All sites surveyed offered teaching to 4<sup>th</sup> and/or 5<sup>th</sup> year students.

Scenarios used at all sites were based on acute clinical cases and ranged from various medical and gynaecological emergencies to cardiopulmonary resuscitation. All sites used equipment for both high- and low-fidelity SBE. Clinicians designed scenarios at all sites, with additional input from non-clinical staff at two sites; a simulation manager at one site and medical students at another site. Sessions incorporating interprofessional learning were provided at three of the five sites. All sites also had dedicated simulation teaching staff, with three of the sites also providing ad hoc staff depending on the session delivered. There was a mean of 4.4 (2-7) students per facilitator in each session

Two sites reported that they gave feedback to students after SBE sessions, one gave formative and the other summative feedback. The other three sites reported that they gave no formal feedback. Otherwise, three of five sites reported interprofessional SBE: medical students worked with trainee and qualified operating department practitioners at two sites and with qualified nurses (but no nursing students) at a further site.

## Discussion

SBE is offered routinely to St. George's students at all satellite sites that responded to our survey, and in line with guidance from the GMC (2009). The teaching offered at all sites was based on acute scenarios, the effectiveness of which has been examined extensively (Smith *et al.*, 2007; Lateef *et al.*, 2010; Beal *et al.*, 2017). However, the number of sessions offered per placement, the year groups taught, student-facilitator ratio, feedback and IPE varied across the different sites.

A low student:facilitator ratio can have a positive impact on student outcomes (Dubrowski & MacRae, 2006; Monks and Schmidt, 2010). This might therefore be a useful area to investigate in further study, in order to ensure students across St. George's placements receive similar learning opportunities to acquire the necessary knowledge and skills

regardless of their placement site. In addition, there also does not appear to be systematic summative assessment of student's performance and it may be possible that standardised assessment across the various satellite sites also helps facilitate and assess uniformity of SBE provision.

The use of IPE within simulation teaching is another key point from this study. IPE has been shown previously to improve opinions on interprofessional working amongst both medical and nursing students (Lockeman *et al.*, 2017). SBE by its nature, in reproducing clinical practice, may be an effective mechanism by which IPE could be supported more widely across, not only other St. George's healthcare undergraduate courses, but also professional ones in the different satellite sites.

All sites used a mixture of high-fidelity and low-fidelity simulation equipment. Despite the differences in complexity, both approaches are efficacious; facilitator competency, knowledge and skills taught, are important factors when considering whether to use high-fidelity or low-fidelity simulation (Munshi *et al.*, 2015). Therefore, it seems rational to encourage both high- and low-fidelity SBE in order to deliver flexible medical education to St. George's students.

## Conclusions and Future Goals

Simulation is widely integrated within medical education at St. George's. All sites focused on delivering scenarios that reproduced acute clinical situations. The education provided across the major St. George's satellite sites appeared diverse in terms of the number of sessions and scenarios offered, student: facilitator ratios, formal assessment given, and, inclusion of IPE. An effective SBE strategy may need to consider requirements of quality assurance for such simulation teaching across St. George's satellite sites.

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# 7. Teaching the transition from medical student to doctor: the 'Preparation for Medicine' sessions

*Claire Spiller*

## Abstract

Seeing transformation as the professional development from medical student to doctor, the question arises as to whether the attitudes, behaviours and practice that characterise this change can be identified and taught? The transition from pre-clinical studies to the clinical environment (T Year) is an important liminal moment in this developmental process. The 'Preparation for Medicine' sessions form part of the weekly MBBS T Year clinical skills curriculum and aim to introduce students to their first full clinical placements in Medicine. In re-imagining these sessions, I have modelled in elements which I have observed to be difficult for students in this transformative process: developing clinical reasoning, dealing with uncertainty and learning how to learn in the clinical environment.

## Keywords

Student development; clinical reasoning; uncertainty

## Introduction

The professional development from medical student to doctor can be seen as a transformative process, and the transition from pre-clinical studies to the clinical environment is an important liminal moment in this process. But what are the attitudes, behaviours and practice that characterise this change, and can we teach them? How do we get our medical students thinking and acting like doctors?

The 'Preparation for Medicine' sessions are two one-and-a-half hour sessions that form part of a wider clinical skills curriculum in the first year of clinical medicine at St George's (termed 'T' Year for 'Transition' Year). They run six times across the year, prior to the students commencing on a 5-week general medical clinical placement, and should, by definition, work to prepare the students for this experience.

As part of a redesign process, I was keen to incorporate elements I had observed to be key but challenging elements in this transformative process: developing clinical reasoning,

adapting to the uncertainty of the real-world clinical environment, and learning how to learn in this new setting. In order to achieve these elements, a format of two simulated clinical environments was devised: the first, a ward round, where students see four 'patients' new to the ward; the second, seeing five new admissions to the medical team in A & E resus (area dedicated to most unwell emergency patients), both facilitated by a qualified doctor tutor.

## Clinical reasoning

A student presents a history of a patient with a headache. When pressed for a differential diagnosis, the answer comes as 'stroke'. This is unlikely: strokes don't present primarily as a headache, and no neurological features were mentioned in the history. Exploring a little further, I see the connection. The patient having presented with a headache has features sufficient to warrant a brain scan (CT head). On the scan, an old ischaemic stroke is seen and has become the focus of the admitting team's attention. The student, new to the clinical environment, conflates the two: the presentation and the active problem (headache and stroke).

It is apparent what is lacking here: a reasoning process understanding how the patient's symptoms and story translates into a working diagnosis or diagnoses. This is exemplary of a common issue experienced by T Year students. Armed with a checklist approach, they are not yet in a position where they are able to appreciate the diagnostic power of certain questions and answers.

How then, can we promote this diagnostic reasoning in our teaching? Using Bowen's (2006) conceptualisation of the process, accurate problem representation is a key early stage. This can be judged by a succinct summary of the important diagnostic features of the case. This prompts a search for an appropriate 'illness script'; an organised and stored collection of knowledge and experiences of a medical condition: which of these fits the problem representation? For Bowen, when teaching this process, articulation is paramount: learners should explicitly verbalise their thinking and where there are gaps in understanding, a teacher should model theirs aloud.

These principles are actively engaged in the 'Preparation' sessions. On the ward round, the first task for each patient encounter is the opportunity to formulate a problem representation in the form of 'presenting' the patient to the registrar. Patient 'clerkings' (histories and examinations documented in the 'notes') are provided to the students in advance and they are asked to come prepared. This process encourages student to try to highlight what is the

most relevant and useful information pertaining to diagnosis. Following the presentation of the summary, the history and examination findings are interrogated facilitated by our 'expert' reasoners, engaging and embedding the student's illness scripts: What supports a diagnosis of x; why is it not y? This process can be accentuated through the choice of cases. Across both sessions, certain patients will demonstrate features of two closely related illness scripts, the direct comparative process serving to highlight the key diagnostic information (e.g. sudden-onset pleuritic chest pain – pulmonary embolus vs pneumothorax; collapse with transient loss of consciousness – syncope vs seizure).

## Dealing with uncertainty

The picture of the diagnostic process I have painted thus far, is that of a search for clues and presentation of evidence. It is not surprising therefore that parallels have been drawn between medicine and detective fiction (Montgomery Hunter, 1991). The search for the 'culprit' is the thrust in medicine and murder mystery, thus we tend to format cases and problem based learning in medical education such that students are working towards 'the answer': The clichéd denouement of both detective and medical fiction reveals the neat and tidy solution tying up all loose ends.

In the real world however, our analogy doesn't always bear out, with clinical medicine bringing us a more complex picture: we can't explain the patient's symptoms ('no answer'), there are multiple diagnoses to consider ('two answers') and working diagnoses are dynamic, and may need to be rethought ('wrong answer').

All of these paradigms have been modelled into the Preparation sessions. Whilst in 'resus', the students encounter a patient with a reduced conscious level. With no option to explore the history and limited basic information provided by initial assessment (ABCDE), the differentials are many and there is no clear resolution to this case. The learning objective for the students here is to think about structuring our thinking in the face of uncertainty. Introducing the 'surgical sieve', a categorisation model, differentials can be uncovered and plan for investigating each discussed. Though the students may leave the patient without an 'answer', they may at least have a plan. Within the same session, the students also meet a patient with 'two answers'. The patient, presenting unwell and in shock, has both diabetic ketoacidosis (DKA) and a lower respiratory tract infection. The students may be quick to uncover one of these, but cannot assume their job is done. Both could be causing the shock and should be identified and managed simultaneously.

The 'wrong answer' takes the form of a patient on the ward round diagnosed with a urinary tract infection, whose history is in fact more in keeping with that of a syncopal collapse. This challenges two pillars of apparent certainty in medicine: the medical notes and clinical investigations. Both of these are often regarded as providing a factual 'truth' by students, a reductionism which can limit the ability to reason through a case. This questioning of the working diagnosis and provision of an alternative reason for a positive urine dipstick works to challenge the reductionist black-and-whiteness of medicine: an impression that pre-clinical academic medicine can leave students with.

## Learning how to learn

We have already seen the importance of role-modelling in the verbal clinical reasoning of our tutors, and the pseudo-clinical environments provide opportunity for further learning through these means. One in particular is done by the students themselves: they are modelling how they may learn in this new learning environment.

Students have often been heard to complain in their first clinical year that they never get any 'teaching'. Teaching to them remains sat in a classroom being delivered knowledge. Part of their transformation into the clinical sphere also involves a transformation in learning style. These simulations seek to advertise this transition. This is most explicitly achieved in the ward round. At the end of the session, the students have some time for reflection. They are asked 'how can you learn on a ward round?' and prompted with what they have done today: presented a patient's history; examined the patient; looked at the observation or drug chart; interpreted investigations and maybe even kept a jobs list (what needs to be done next – even more learning opportunities!). This highlights the richness of the clinical environment for learning opportunities – but they are that, opportunities. They must be looked for and taken, as they will rarely be presented to them, compared with a static classroom 'lesson'.

## Recommendations

These sessions are not without their limitations and will be undergoing a process of evaluation with the students this year. However, I hope that the merit of including the above features in teaching in order to support a professional transformative process is clear.

- **Be explicit with reasoning**

Never assume students understand. Use summarising to assess accurate problem representation and make 'why?' your favourite question. Force them to be explicit with their reasoning, and if unclear, role-model yours. Helpful structures to utilise in the

clinical setting such as the SNAPPS technique draw on these principles (Wolpaw, Wolpaw and Papp, 2003).

- **Embrace uncertainty**

A degree of black-and-whiteness is required for us to negotiate the clinical environment. However, an over-reductionist approach is unhelpful and potentially even dangerous. There is room for us to help students appreciate this. In writing clinical cases consider if there is room for no answer, two answers or wrong answers. Personally, I would love to see an OSCE case with this built in.

- **Appreciate the importance of role modelling**

Don't underestimate how much students will learn from you as a teacher: it's not just the content of what you are saying. Role-modelling is a key factor in learning behaviours such as reasoning and professionalism. Simulated scenarios also allow for students to role-model themselves: they can see how they may perform in the clinical environment, but in a more secure and learner-centred way.

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## 8. Transforming education at St. George's with Canvas

*Evan Dickerson, Kerry Dixon, Bryony Williams*

### Abstract

This workshop outlines the reasons behind the implementation of Canvas VLE at St. George's and articulates how use of the new VLE will transform the educational experience for degree course students at the university. Issues explored within the paper include educational transformation as it relates to learning technologies, the structure of learning modules in Canvas, and planned support for the rollout of Canvas at St. George's within the Canvas Project and beyond. The paper concludes with some considerations for the future.

### Keywords

Canvas; transformation; technology

### Background

Any consideration of the theme of educational transformation needs to be sensitive to linguistic nuance. To 'transform' is defined as making 'a marked change in the form, nature or appearance of x' (transform, 2018) as distinct from 'transformational' which can be understood as that which will produce a change in output, impact or results. It is sometimes assumed that doing the former will hopefully lead to the latter, though this cannot be guaranteed. Likewise, a common assumption amongst academics is that technology-based teaching innovations have the potential to result in 'disruptive' pedagogies, due to the variances created against traditional face-to-face pedagogic models. These disruptive pedagogies necessitate changes in teaching practice, and this can be a significant source of lecturer resistance to embracing learning technologies, if they feel that they do not have the necessary technological skills to support new methods of teaching. It should be noted, however, that it has repeatedly been demonstrated that educational transformation does not consistently, universally or directly result from the use of technology in a teaching and learning context.

## Canvas implementation

In 2016, following consultation with academic staff and the completion of a criteria-based procurement exercise, the decision was taken to implement the Canvas Virtual Learning Environment (VLE) as a replacement for Moodle at St George's, University of London. This was partially influenced by Kingston University's decision to implement Canvas as their VLE, taken a year or so previously. The view was taken that with both Kingston and St. George's using Canvas, that the staff employed by the Joint Faculty would be able to expand the interprofessional education course offering.

As the procurement decision preceded the appointment of the authors to their current positions at the university, we understand that negative scores and comments in the National Student Survey (NSS) in 2015 and 2016 specifically regarding Moodle, was key to influencing the decision to changing VLE platforms. NSS comments from 2017 continue to bear out the view that the student experience when using Moodle is a poor one at St. George's, due in part to poor site organisation, and the lack of site maintenance or updating of contents and learning resources by academics. The lack of consistency evident in the use of Moodle at St. George's was not just between different course sites, but also within individual course sites. This situation makes one reflect on an assertion made by Garrison and Kanuka in 2004:

'Higher education institutions must react to technological change with understanding and vision but also with the courage and decisiveness that will free resources to produce results and realize potential. To date, most institutions of higher education can be described as lurching about.'

Whilst the situation at St. George's until recently could well be said to echo the feeling of 'lurching about', with the introduction of Canvas a step change in the attitude and approach of senior management is evident. Indeed, St. George's senior management are displaying an increasing awareness of the correlation between learning technologies and an improvement of institutional metrics, thus evidencing that progress is already being made towards addressing a central recommendation by Davies, Mullan and Feldman (2017):

‘Digital technology should be recognised as a key tool for higher education institutions responding to the TEF. Providers should be expected to include information on how they are improving teaching through the use of digital technology in their submissions to the TEF.’

## What is transformational about Canvas, and how will it transform the St. George’s educational experience?

The range of functionalities offered within Canvas is broadly similar to those in Moodle, indicating that the system itself does not constitute an educational transformation, and neither does the implementation of an LMS such as Canvas within an education provider. It is our assertion that the potential to make Canvas a transformational tool in any educational setting is founded on establishing principles of sound pedagogic use, which are observed in consistent practice by academics, supported by learning technologists as required, within the university.

Jack Mezirow, the key theorist behind transformational education, holds that ‘learning is understood to constitute a new or revised interpretation of the meaning [of the learning] in order to guide future action’ (Mezirow, 1996). In particular, we see three aspects of Mezirow’s conception as being important in the context of technology enhanced learning at St. George’s: first, as an enabler for the interpretation of facts; second, this allows students to construct and reconstruct knowledge; and third, encourages past experiences or learning as the shapers of future actions.

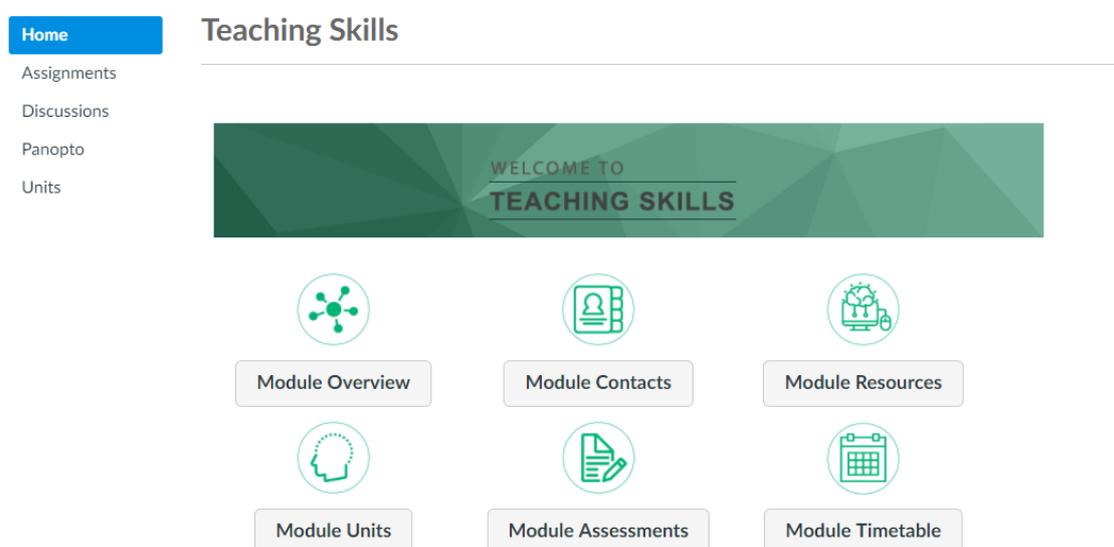
It is appropriate to articulate some of the key drivers for change that a university might use as the basis for driving a switch towards a more transformational educational student experience. These include, the requirements of Government policy, institutional competition and reputation, NSS scores and TEF results, or putting student experience at the core of our decisions. Equally, a prioritization of staff professional and personal development, ensuring that teaching and learning provides a consistent experience by actively engaging students with their learning.

There are several common outcomes that result from transformational education. These can include an empowered sense of self for learners, as well as increases in self-confidence in new roles and relationships, learners’ openness to and ability to engage differences of all kinds, fundamental changes in the way learners see themselves and their life assumptions,

functional strategies and resources for taking action and gaining control over their lives and compassion for and new connectedness with others.

## The structure of learning modules in Canvas

Our assertion that academics at St. George's will be able to transform the educational experience they deliver via Canvas is based on their engagement with issues and concepts such as learning design, encouraging and implementing higher order learning, the student journey, engaging with pedagogically appropriate use of learning technologies and overall student engagement with educational resources within their modules.



**Figure 1: Canvas home page displaying major sections within a module**

We introduced workshop participants to the structure of a learning module, as implemented through the learning design adopted by St. George's. The major sections (illustrated in figure 1) which shows the Canvas home page of a typical undergraduate module, are as follows:

1. Module Overview section: containing overview description and learning outcomes.
2. Module contacts: major personnel of the module with their contact details
3. Module resources: module reading list, online journals and multimedia
4. Module timetable: linking to data from the timetabling system
5. Assessment forms: formative and summative assessment, including submissions via Turnitin
6. Learning materials, structured with a consistent, logical and clear design, including:

- Pre-reading
- Lecture slides
- References
- Lecture recordings
- Quiz: an interactive tool which consists of a set of questions presented to the learner which, unlike a paper quiz, can enable automatic marking and therefore instant feedback. Quizzes can be used for formative or summative assessment.
- Reflective narrative diary applying learning to professional practice

## How we plan to support the continued rollout of Canvas

As part of the workshop we asked participants how they wished to be supported in phase 2 of the Canvas implementation project (December 2017-September 2018) in order to achieve the intended target having all courses with an active presence in Canvas by the start of the 2018/19 academic year. The 14 workshop participants were asked to register multiple votes using Mentimeter for their preferred method(s) of support, with the following breakdown: informal discussions (11 votes), one-to-one training (10 votes), drop-in sessions (6 votes), online training (6 votes), and group training (5 votes).

These votes lend validity to the plan for supporting the rollout of Canvas which has been drawn up by the Learning Technology Services team, in collaboration with Shamit Manilal, St. George's appointed Canvas project manager. Those plans include holding learning design meetings with programme teams, maintaining the Learning Technology Services team's open door policy to facilitate access to support, quality standards to be agreed and associated procedures to be put in place and annual reviews of modules to ensure that instructional content is continuously improved and remains pedagogically appropriate. The central feature of support offered centred on training available to the university community, provided in organised groups that covered the three core areas of navigation, modules, assessment and feedback.

Looking beyond the scope of phase 2, we are adamant that providing continued support and encouraging pedagogic innovation will be key to realising a significant return on investment around Canvas. Thus, the workshop handout (figure 2) pointedly draws attention to supporting innovation. Regarding the implementation of any technology where continual evolution of its use to meet institutional needs is central to success, it is never a case of 'implementation done, box ticked, no further attention needed' on the part of academics.



**Figure 2: Workshop handout outlining key stages in transforming education with Canvas from initial implementation through maintaining quality and supporting continued innovation**

## Conclusions and thoughts for the future

Following the implementation of Canvas at St. George's, an evaluation of the new LMS will be needed to determine if it has been instrumental in delivering a transformational educational experience. Key indicators of delivering a positive outcome could be addressed through the following questions: Can the university evidence impact against common outcomes and shifts in attitude? Has the university met external and internal drivers (such as NSS scores, TEF ranking improvement, teaching and learning strategy)? Have online pedagogic practices been embraced? Is student feedback being taken into account? Has the student experience been improved? Has graduate destination data improved?

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# **Part 3**

## **Student Voices**

# Introduction

*David Oliveira*

Medicine is a satisfying career in itself, even if limited to purely clinical matters. However, there is no doubt that the satisfaction can be enhanced by developing additional aspects, such as education and research. It might be argued that education is built in already: all students experience it and teaching junior colleagues is part of nearly everyone's job. Research is more difficult. Students are not necessarily exposed to it, and usually don't know how to go about getting involved; time and funding are also important potential barriers. In this context the Connect platform has the potential to transform the first and arguably most difficult step: finding a suitable project. To date, more than 50 students have been connected with researchers. As the authors note, a key challenge will be sustaining change; it will also be important to generate information on the number of projects that actually take place, and outputs such as publications, posters, etc. If these measures show success, then there may be potential for generalising the platform to include other institutions.

## 9. Connect - a transformational student platform

*Alexander Zargaran, Amal Thomas, Aasim Murtaza, Harry Spiers, Mohammed Turki*

### Abstract

Transformation is a dynamic process, and certain behaviours which are deeply ingrained within institutional cultures, require quantum leaps to alter and improve established processes. One such process is research within medical school: whilst students are well-equipped to tackle basic research tasks, there are limited opportunities to become involved with research, despite research ideas being constantly generated in clinical practice. Connect is a student-led digital platform that serves as the interface between the university and the research world, with the goal of facilitating research projects that would not have otherwise taken place due to lack of workforce. In this way, Connect strives to maximise value to both the student and research community by transforming the way we go about academic research. Since August 2017, Connect has connected more than 50 students with researchers, started an undergraduate research fund of approximately £8,000 and collaborated with the university to start a peer-tutoring scheme.

### Keywords

Education; innovation; research

### Introduction

Connect is a student-led digital research platform, founded by a team of medical students, that serves as the interface between the university and the research world, with the goal of facilitating research projects that would not have otherwise taken place due to lack of workforce. In this way, Connect strives to maximise value to both the student and research community by transforming the way we go about academic research.

Eckel, Hill and Green (1998) defined 'institutional transformation' as something that:

'alters the culture of the institution by changing select underlying assumptions and institutional behaviours, processes and products; is deep and pervasive, affecting the whole institution; is intentional; and occurs over time'

However, there is an important addition to make to this definition pertaining to the need for change. As Winston Churchill stated, 'to improve is to change, to be perfect is to change often' (The Churchill Project – Hillsdale College, 2016), highlighting the importance of transformation. This definition demonstrates that transformation is a dynamic process, and certain behaviours which are deeply ingrained within institutional cultures, require quantum leaps to alter and improve established processes. One such process is research within medical school: whilst students are well-equipped to tackle basic research tasks, by virtue of both the CPH-PPD module as part of the core medical curriculum as well as having time to engage with research, there are limited opportunities to become involved with research outside of the dedicated SSC block. At the same time, research ideas are constantly generated in clinical practice, though not all acted upon due to time constraints faced by doctors in full-time employment. Intrinsically motivated students must find a way to get involved in research.

## How Connect works

There are currently over 100 clinical researchers affiliated with Connect. The process is as follows: 1) Researchers sign up to collaborate with students on projects 2) Students sign up to participate in these projects 3) Students are allocated to projects using an algorithm that takes into account important factors including skills and experience. In this way, Connect has transformed the process of getting involved in research by creating and becoming the interface between the students and researchers. Projects are allocated in monthly drafts, and students apply through the Connect website<sup>1</sup>. Since its inception in August 2017, Connect has connected more than 50 students with researchers.

## Challenges: Past and present

Change does not come without resistance, and overcoming challenges and obstacles is an important part of refining an idea until it arrives at its best possible form. Kotter's Eight-Step Change Model (2017) outlines the process of leading change, which can be split into three discrete stages: 1) establishing the need for change 2) engaging and enabling the organisation 3) implementing and sustaining. Feedback from interested clinicians was that it was a great concept and that there was a real need for an initiative like Connect. The focus of our challenges were in stage two, of engaging and enabling the organisation. In the case of Connect, our end-users are both researchers and students, necessitating a bottom-up style approach with the involvement of both researchers and students. There was also

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<sup>1</sup> <https://stgeorgesconnect.wixsite.com/home>

considerable buy-in from researchers, many of whom sent out emails to as many of their colleagues as they could, endorsing and advocating the initiative. Furthermore, the involvement of researchers as 'patrons' strengthened credibility.

There was some resistance due to the limited supply of research projects, with reservations concerning having students competing with registrars for research. It was therefore important to stress that Connect was not intended to redistribute existing research, but rather to make possible the projects that would not have otherwise been pursued, by connecting researchers with passionate and skilled students. This was made clear during the many presentations made to departments and individual researchers over summer and was an important part of establishing a link with departments such as Cardiothoracic Surgery, Gastroenterology and Clinical Genetics.

Our future challenges centre around stage three of sustaining change. Connect has been running a small mentoring scheme, whereby experienced student researchers act as 'engagement representatives', who help to mentor students as well as providing quality assurance for the researchers in exchange for acknowledgement or co-authorship on resulting publications. It is hoped that by helping students gain more research skills, students will eventually be able to lead their own research projects independently.

## Conclusion and future scope

Connect has enjoyed considerable buy-in from its end-users. By creating and becoming the interface between students and researchers, Connect strives to transform the way students become involved in research. With the level of engagement from both students and researchers, there is great potential for future growth. As transformation is a dynamic process and positive change is needed for improvement, Connect is finalising two projects: a research fund for students of approximately £8,000, and a formal peer-tutoring scheme at the university.

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# **Part 4**

## **Poster Commentaries and Other Contributions**

# Introduction

*Judith Ibison*

As one piece in this section highlights: medical practice is as old as humanity and has constantly transformed itself through the changing paradigms of the scientific understanding of medicine and through cultural and evaluative shifts. Innovation in clinical care has accelerated over the last 50 years and educational transformation of the workforce is necessary to deliver and evaluate new forms of health interventions and care.

This section begins back in time, describing the evolution of, and approaches to, accountability for patient safety by the healthcare workforce. Other contributions describe projects engaged in the transformation of the healthcare educational curricula for students so that they are empowered to work as practitioners with a broad and deep perspective on how care impacts on patients.

The historical perspective is illuminated by two pieces: one describes the acceleration of the implementation of the medical humanities curricula, to a previously science focused educational environment. One output of this latter innovation was to highlight revolution, not mere transformation, in a piece on the belated and staggered entrance of women to the medical profession at St George's. The second piece reminds us of the historical interplay of knowledge paradigms with accountable systems of patient safety.

Moving forwards to contemporary times, a set of three posters reflect on the three phases of a transformative process of initiating and sustaining the skills of critical thinking in healthcare students. These three focus on critical thinking, which is a key attribute needed by all clinicians, so that they can accelerate progress in care, develop a healthy scepticism towards tradition, yet can evaluate innovations for real value. This theme is continued in a fourth poster describing how healthcare students can be routinely apprenticed into critical thinking, by the inclusion of quality improvement projects in their curriculum which involve not just appraising care, but by practising implementing real change. The last piece in this poster section illustrates the transformation of the learner perspective on healthcare through some interactive student project work, where the focus on health is shifted from 'downstream' disease presentations and treatment paradigms, to understanding 'upstream' public health causes of ill health, and interventions which may prevent illness.

The final two pieces allow us to reflect on how learner and care transformation are actualised in real time - locally and internationally. One poster describes the local immersion of a healthcare student in a piece of authentic quality improvement work, as part of their education. This piece, on the work of an air ambulance unit, shows us how care is never static, but new horizons of care constantly appear; in this case the emergence of new treatments for patients needing anti-coagulation. Finally, having moved from the past to a rapidly transforming present culture of care, the final piece describes the dissemination of a valuable educational paradigm, completing a virtuous circle by focusing again on patient safety, but this time by accelerating the educational transformation of the healthcare workforce internationally.

# 10. A temporary transformation - the first women medical students at St. George's Medical School, London

*Jenny Day, Hugh Thomas*

## Abstract

The admission of women to a medical school that had trained only men for the previous two centuries was a major transformation. Further educational transformation has been the increase in the study of medical humanities by medical students and the development of a medical school archive to facilitate the study of medical history. This has enabled students to research some of the historical gender issues in medical education and consider what lessons we can learn when considering future developments to improve training, workforce retention and the patient experience. This poster deals specifically with the first women students admitted to St George's, University of London.

## Keywords

Women doctors; educational archives; admittance

## Poster

Available to view <https://doi.org/10.24376/rd.sgul.6120749.v1>

## Background

A transformation in our educational programme over the last five years has been the increase in the amount of medical humanities teaching in the medical curriculum. As St. George's is a health science-based university, our students do not interact with an academically diverse peer group. The importance of studying medical humanities has been discussed by Gordon and Evans (2007) in a publication from the Association for the Study of Medical Education. They have suggested that benefits include extending the future doctors' sensitivities and insights regarding human experience in all its variety and deepening their understanding beyond merely biomedical interpretations of health and illness.

A further transformation at St George's has been the appointment of a qualified archivist as well as financial support from the Wellcome Trust to preserve and develop our existing

archival material. This is a major addition to our resources for teaching the history of medicine. It has enabled our students and other researchers to study original committee minutes, hospital reports, student record cards and student magazines to see how the admission of women students came about and also how it was perceived by staff and students.

There has been no greater transformation in medical education in the United Kingdom than the admittance of women students to a profession which had been previously the dominion of men alone. St George's hospital was founded in 1733 and has been involved in training medical students since it was established. Our poster gave a brief illustrated history of the first four women medical students to train at St George's in 1915 - a century ago.

A major impetus to admit women was the declining number of male applicants as a result of the First World War and, we suspect, changes in society with women taking on many previously male roles. There were also political demands for women to be given the vote and the newspapers and medical journals of the time were regularly discussing female emancipation.

The discussion of admitting women to medicine is limited in the official minutes but there was agreement among senior consultants that by 1917 there may be a shortage of junior hospital staff. Concerns were expressed about the physical changes required to the relatively small building at Hyde Park Corner. Installing female toilets and changing rooms appeared major issues. How the sporting teams would also be affected by the lack of men also caused much concern. However, there were a few students who wrote letters to the Medical School Gazette supporting the admission of women. For present day students and staff who have read the letters in the archive from young women literally pleading for the opportunity to undertake clinical training at St George's there is a new insight in to the struggle that they had storming the male bastion that was 'The Corner', as it was known. Its innate conservatism and chauvinism was typical of most London and provincial medical schools.

Although 19 women were admitted between 1915 and 1919, no one championed the cause of women's admission after the First World War ended, even though their student record cards show that they were academically successful. It appears that the Second World War may have had an influence with the re-introduction of women students in 1945 but we have not researched this.

Our poster on women students also shows the historical challenge that an old established medical school faces when trying to improve gender equality. The university now has a Bronze rating in the Athena SWAN (Scientific Women's Academic Network) programme. The rating is based on an independent assessment of how an academic institution promotes equality of opportunity and how its organisational structure and appointments reflect this.

As our archive has become more established and has a 'web presence' we are attracting historians who are studying past alumni and also the social profile of our students. In the 18<sup>th</sup> and 19<sup>th</sup> century students usually represented the wealthy and privileged. There were no grants and until around 1900 the junior medical staff were unpaid meaning a private income was usually required. With changes to our student funding, we would do well to reflect on who we select for training and are there financial barriers which put off potential applicants from more modest backgrounds? With women students now being in the majority, gender selection appears to be a barrier we have overcome, although establishing work programmes for doctors who have to balance family and professional responsibilities remains a challenge, as is the gender pay gap. However, there are innovative solutions. In 2017 many women and men do not want to practice medicine full time and prefer a better work-life balance. Our historical records suggest that many of the senior medical and surgical staff had less busy routines than today and conducted life at a more 'gentlemanly' pace, over which they had a lot of control in pre- National Health Service days.

Perhaps a major educational transformation may be around the corner, which allows training and practice of less intensity, perhaps greater patient safety, and better doctor health, than is currently experienced. This would do much to improve medical workforce retention and patient experience.

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# 11. Reflecting on practice: 2500 years of getting it wrong - a brief history of medical error

*Jonathan Round*

## Abstract

Clinical medicine is now two and a half millennia old, and with its establishment as a taught discipline came correct and incorrect ways to manage a situation. Medical error is as old as medicine itself. This article describes the four eras of medical error: ignorance, denial, personal and the systemic era, which we are now in. The key features of these era, are each illustrated with a seminal scenario that also heralded the next era. Finally, the article reviews where we are today, demonstrating how 'modern' healthcare has roots in all of these eras.

Perhaps by learning from these lessons, we can deliver safer medicine in the future.

## Keywords

Medical error; patient safety; history

Clinical medicine, as a description of the right way to address a medical problem, is now two and a half millennia old. And medical error is as old as medicine itself. Over this vast amount of time, it has had to reinvent itself several times, driven by forces as varied as religion, politics, superstition, the law, and our latest belief system – science. Mostly, medical practise is not invented by the practitioners but is instead handed down from generation to generation, through apprenticeship, observation, lectures, tutorials and peer reviewed journals. In order to change medicine, a key event is always the educational transformation, as this frees subsequent generations from outmoded practises.

It is often difficult to see educational transformation happening, but by looking over the entire history of medicine, step changes can be discerned. In this PechaKucha, I chose to review how the transformation in thinking, practise and processes has occurred in the context of medical error. I describe this in four eras: ignorance, denial, personal and systemic. For each, I describe the key features of the era and examine a key case, one which led to the transformation of our understanding of medical error and heralded the next era.

The ignorance era is exemplified by the death of George Washington in 1799. Medical historians have attributed his death to either epiglottitis, a quinsy or bacterial tracheitis. The former president's death was hastened by bloodletting, with an estimated 40% of his blood volume removed. At that time, doctors had no evidence, research had not been done, and research methodology was yet to be established. They were ignorant and did what they thought best, the characteristics of this era.

The next era was denial, illustrated by the failed attempts of Igor Semmilweis to address maternal mortality at Vienna General Hospital in the 1840's. Semmilweis stumbled across the cause of the shocking death rate, linking it to post-mortem dissection. Without logical linkage he instigated hand washing processes. Using data, he was able to show the dramatic effect of this measure on mortality. Tragically, his ideas and his evidence were rejected by the local establishment, who were in denial, preferring their own established experience. These are the hallmarks of this era. Over the next century, the primacy of experience and authority has been gradually eroded by the accumulation of evidence, put together as protocols.

By the 1960's a new era was entered – the personal era, in which deviation from protocols was seen as a personal failing. Patient safety began to emerge in parallel as a distinct theme (rather than the absence of medical error) and is described as all processes that promote and assure harm-free healthcare. This discrepancy is well illustrated by mass murderer Harold Shipman. He was personally blamed for his actions, both by the legal processes and the public. However, the fact that he was able to do so for so many years is a failing of patient safety systems. There was no monitoring, no oversight, no processes for acting on the multiple data and police reports suggesting something was amiss before he had killed over 200 of his patients.

Following this case, there has been a dramatic rise in monitoring processes in all areas, and at all levels. Instead of blaming an individual for a mistake (or in the case of Shipman, multiple murders) there was a move to see medical error as inevitable, but patient harm as avoidable. In the systemic era the belief is that patient harm is caused by poorly designed systems that promote dangerous practise or do not identify and correct mistakes. This era is exemplified by the death of Richie William after vincristine was mistakenly injected into his spinal fluid, rather than intravenously. The involved physicians were acquitted of manslaughter, with the setup of hospital processes, staffing and pharmaceuticals placing the doctors in a situation where an error of this severity became likely.

This history of error illustrates well the transformation in how patient safety has been understood, moving from ignorance of error, through denial of evidence, to personal blame and now a concept of systems preventing or promoting error. We now must progress to a more mature understanding still, where we humbly acknowledge that we don't really understand everything, where we sometimes still prefer experience and authority over evidence, where we are still inclined to personally blame individuals and where we slavishly trust a system to protect our patients.

Open and objective review of the way we think about and categorise our understandings of all aspects of medicine and medical education is vital to the continued development of these disciplines. Without this, we cannot hope to transform these understandings into new paradigms more fitting and more relevant to students, patients and the facts themselves.

## 12. Transforming approaches to critical thinking: the use of a critical thinking skills framework to enhance learning, teaching and assessment

*Hilary Wason, Cheryl Whiting, Fran Arrigoni, Colin Clarke*

### Abstract

Our contribution focuses on the innovations in learning and teaching that have arisen from the outcomes of an interdisciplinary international research collaboration on critical thinking, aiming to enhance curricula and improve students' development as required by employers. This has culminated in the development of a critical thinking skills framework and toolkit designed to inform learning, teaching and assessment practice. Our transformative educational endeavours are illustrated in three posters. Collectively these highlight our approach to developing student's self-efficacy to master critical thinking and explore the challenges faced in leading students through 'conceptual gateways' to a more accessible way of thinking about information (Meyer and Land, 2005). Our key message is that to overcome such challenges we must, as educators, firstly transform ourselves by revising our own personal assumptions about learning and embrace a reflective and evidence-based exploration of our own methods of practice, expectations of ourselves and of our students.

### Keywords

Critical thinking; learning and teaching; student engagement; curriculum development

### Poster

Available to view <https://doi.org/10.24376/rd.sgul.6205214.v1> under title 'Transformational Education: learning for life'

### Reflection

Transformation is a process of change, in the context of developing ourselves and our students as independent autonomous and critical thinkers. Prior knowledge and experiences constrain our perceptions of the world around us and our ability to avert the ideas and opinions of others. This can deny us the opportunity to make the most of our learning experiences.

Overt teaching of critical thinking (CT) skills builds self-efficacy, improves learning and enhances students' academic performance (Putwain et al., 2013). Kingston and St George's have been at forefront of developing interventions to embed CT skills within undergraduate curriculum to equip students for academic success, and future employment. The outcomes of an interdisciplinary international research collaboration have informed the development of a CT skills framework and toolkit designed to inform learning, teaching and assessment practice. The toolkit, which is underpinned by the work of Abrahmi et al. (2015), operationalises our institutional adaptation of Facione's CT skills framework (Facione, 1990). Containing 10 branded teaching tools, it offers a flexible framework of instructional guides and worksheets which are tailored to a variety of learner levels and assignment tasks. With the aid of a small HEFCE Catalyst project fund, the toolkit has been piloted within the first year of five undergraduate degree programmes across two diverse employment sectors (Business and Healthcare).

Our series of 3 posters builds a picture of our approach to the development and evaluation of CT skills. Our quest to enhance students' ability to independently and systematically analyse problems and make decisions, has uncovered the challenges faced by students and how they make sense of the concept of critical thinking. This has encouraged us to review personal assumptions and transform our approaches to learning and teaching. It is evident that there is a need to identify effective methods that facilitate students' applied understanding of the required skills to be less subjective and more objective in their reasoning.

In transforming our students' way of thinking and enhancing their capacity for autonomous critical thought, as educators we must firstly transform ourselves by revising our own personal perspectives and modifying our working practices. Transformation starts with challenging the beliefs and assumptions we hold about how our students think, learn and behave, and understanding more about our students' critical abilities. In challenging our perspectives of how we facilitate learning, teaching and promote student engagement with the concept of critical thinking we can consciously work towards meeting the students' development needs, adopting and promoting best practice with revised critical insight.

It is here, that emphasis is placed on adopting an evidence-based approach; using data as a foundation for innovation in the development of critical thinking skills. Central to this is gaining clarity through the process of shared critical reflection through interviews with staff, student and employers, as well as investigating students current critical thinking abilities using a well-recognised instrument called the Watson-Glaser critical thinking test <sup>TM</sup> (2011).

Using this research, with data and evidence from the literature, provides us with focus and direction; paving the way for effective learning, teaching, engagement and enhancement strategies.

To us transformation is empowering and emancipatory, our knowledge and understanding becomes actively constructed through collaboration and engagement with students and employers as partners in the process. We each gain metacognitive awareness; becoming consciousness of what is expected, and the steps to be taken personally and collectively to achieve these expectations. It is here transformation becomes strengthened, as we become enlightened and potentially liberated from previous assumptions and practices. Our engagement and partnership in understanding the development of critical thinking skills is the subject of our presentations at the Learning, Teaching and Student Engagement (LTSE) and Change Agent Network (CAN) conferences in 2018.

Module evaluations, student reference groups and appreciative inquiry workshops have enriched our insight and led to an iterative adaptation of the toolkit. The project is being further co-developed with colleagues from the Faculty of Science at Kingston University and it is hoped in time the toolkit will be utilised across both universities and within other institutions too. Our work has led us to gather material for a research informed Compendium of Good Practice; a series of staff and student generated impact case studies for dissemination internally and externally, as a means of promoting the adoption of good practice in relation to learning and teaching of critical thinking.

Moving forward we have plans to publish our findings and continue to inform on progress and outcomes through twitter @cttoolkit. We aspire to continue development and research using an action research multi-method approach, as our key challenge now is to fully understand students' engagement with the CT skills toolkit and how this and the teaching and learning activities transforms students to become active critical learners, appreciating the value and significance to their academic attainment and employment. We are keen to nurture our existing community of practice and empower students and staff to play an active part in research to inform transform and influence changes within practice.

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# 13. Reflective piece - quality improvement projects

*Saba Khan*

## Abstract

Quality Improvement Projects (QIPs) are educational projects which have been developed to promote leadership and clinical improvement skills in student learners. Mezirow's concept of transformational change, and its three key theoretical stages, are mirrored in Quality Improvement Projects (QIPs). These changes ('psychological', 'convictional' and 'behavioural') are integral to developing a learner's skills 'in practice', which will better prepare learners for their professional career.

On reflection, there are challenges associated with QIPs that relate to clinical maturity, implementation of change and the time needed to effectively deliver QIPs. However, on balance, these projects present a unique learning opportunity that will present students with the ability to demonstrate and develop skills that can only be learnt experientially in the workplace.

The location of these projects in primary care can also prepare students for the professional responsibility of appraisal and revalidation, regardless of their postgraduate speciality of choice.

## Keywords

Transformational change; quality improvement; leadership

## Poster

Available to view <https://doi.org/10.24376/rd.sgul.6121046.v1>

## Reflective piece

The poster was developed to illustrate the concept of Quality Improvement in Practice (QIP); an educational activity that students can engage in, across both primary and secondary clinical care.

In primary care, the concept of 'Quality Improvement' (QI) forms part of the foundation for postgraduate appraisal and revalidation processes. This concept of developing existing improvement activity to formal QIPs is a natural educational progression for medical students already engaged in research projects, and if offered within existing research opportunities, will build a platform for motivated students to transform themselves by exploring change management and developing leadership skills.

The projects can be nested in any department. However, it is apparent that this may be easier to do in smaller teams where QIP activity is already in existence. It does not, however, rule out larger secondary care settings, providing that team members are invested.

Mezirow's transformative learning theory (1991) has three components that can be applied to Quality Improvement Projects. Clark (1991) discusses these three aspects consisting of 'psychological', 'convictional' and 'behavioural' changes that are intellectually mirrored in the practical process of educational transformation. This theoretical underpinning of transformational change requires an adjustment to thinking about practice improvement and development. In primary care QI has traditionally involved audit and presentation of findings. QIPs asks the practitioner to explore further and to develop and implement change.

The first (psychological) stage involves a change in cognitive approach to practice development. The main change being that of implementing a change rather than simply highlighting potential change. The practical implementation of delivering improvements has a very different implication to simply formulating theoretical solutions. Mezirow (1997) discusses the challenge of changing perspectives and how change and improvement can be delivered.

The second (convictional) stage of educational transformation and QI, involves reassessing the existing understanding of practice and evolving this. Quality Improvement can only occur if the fundamental aspect of practice is revaluated, changed and then implemented back in to routine service. In order for this change to be implemented, the practitioners involved need to have changed their perspective on that particular clinical practice and agree to the proposed change. It is important to take into consideration that student learners may find this aspect particularly challenging in a team where the change proposed is not accepted by all those involved. The professional maturity needed to develop clinical practice change may be particularly challenging for learners that are both new and temporary to a clinical team. This change to existing beliefs about practice would form the foundation for further transformational change. Dirkx (2006) discusses transformational change and its underlying

theory from an emotive perspective which is also fundamental to understanding the delivery of QIPs and the associated challenge.

The third and final (behavioural) stage of educational transformation involves a practical behavioural change. This is the last and most crucial part of Quality Improvement, where a change to practice is implemented by all those involved, and that this change is maintained. Practical clinical change involves delivering service provision in a different way to existing practice. This aspect requires both time and clinical ability to deliver this change. Early learners may find this latter aspect of Quality Improvement the most difficult as it would require an understanding of the potential effects across a team. This would involve logistical, financial and practical considerations to the proposed changes. These changes once implemented would then need ongoing oversight. However, the process of considering how this might be done and educationally evaluating all aspects of delivering practical change is a key part of Quality Improvement in a learner. This further step in delivering change from research is the aspect of learning that is missing from traditional audit and service evaluation projects. Cranton (1996) discusses the requirement to develop the opportunity for learners to develop these skills.

It would be useful to further explore the student experience following an introduction of this type of learning. A comparison between primary and secondary care QIPs would be highly informative for future educational development. It is understood that QIPs push a learner to transform by developing more than basic research skills: evolving thought into leadership, team working, financial consideration and practice development. These are key skills for tomorrow's doctors.

In summary, the concept of QIPs are challenging due to time, potential system constraints, and the maturity of learners. However, the opportunity to harness leadership and change management skills are highly valuable to early student learners, in preparation to be tomorrow's leaders.

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# 14. Transformative learning in Public Health - using a Dragon's Den approach

*Georgina Pearson, Hugh Thomas*

## Abstract

All medical graduates should have an appreciation of the importance and scope of public health and the potential roles that they can play in improving health in communities. Using the 'Dragon's Den' approach has proved a popular teaching method, with each student researching and presenting a programme to improve health for a population they have selected. It has encouraged students to think about public health issues in the United Kingdom and globally. It is transformative in the sense that it has taken them away from the bedside and encouraged them to devise plans to work with other professionals, government, law makers and non-governmental agencies to find ways of improving population health and reducing health inequalities. Their proposals are usually based on evidence-based programmes which they have identified in the British and international medical literature. Making an articulate, illustrated short 'pitch' has also enhanced their presentation skills.

## Keywords

Public health; medical education; 'Dragon's den'

## Poster

Available to view <https://doi.org/10.24376/rd.sgul.6120734.v1>

Our poster gave general details of an approach that we have used successfully at St George's for ten years. We consider it transformative in the sense that it encourages medical students to think about the wider issues of health and disease and not just the patient that they see in hospital or the community. Students see that death, disease and disability are not caused or treated solely by medical and nursing services but that there are environmental, social, political and economic factors, many of which the individual has little control over, which can cause ill health and delay recovery. This important perspective has been reinforced by the General Medical Council (GMC) requirement to teach on health inequalities and also an increasing national student interest in global health.

In 2010 the Royal College of Physicians report on 'Future Physicians' stated:

'All doctors should think in terms of health promotion and disease and disability prevention as part of their daily routine. That is not to say that all doctors should be required to see themselves as public health specialists, at least not in the formal sense, but all doctors should consider themselves 'societal doctors' with responsibilities beyond the health of the individual patient.'

At St George's we have a two week Public Health 'Firm' in the Final Year. There are around 40 students in each of the six firms we teach throughout the year. As students are near the end of their undergraduate medical training they have a wide range of medical and surgical experience and we feel are better prepared to study and discuss the wider issues of health and health care. An initial introductory talk suggests that the marked increase in life expectancy that we have seen in high income countries is due by over 90% to improvements in sanitation, diet, immunisation and family planning rather than medical interventions in established disease. The challenge is also posed as to how we could bring these improvements to low and middle-income countries. We also face the continuing challenges in high income countries of reducing the adverse effects of smoking, excess alcohol, obesity and limited exercise.

One transformational approach that we have used, is to get individual students to prepare and give a Dragon's Den presentation on a public health topic which they select. Our poster outlines the five key aspects of a Dragon's Den presentation and we emphasise the importance of using correctly the wealth of information that is available, usually on line, to quantify health problems and also tackle them with an evidence-based approach. These skills are vital if doctors are to be equipped to take on leadership roles within the National Health Service, government departments and Non-Governmental Organisations (NGOs). On a smaller scale, they are also relevant to the current approach using Clinical Commissioning Groups (CCGs) to plan and implement health service care and also work with local government to tackle important health issues.

The main topics that students examined in the twelve month academic session (2016-17) were obesity, road traffic accidents, suicide, smoking, maternal health, HIV and alcohol misuse. All of these require multi-agency services for effective prevention and treatment.

Many students choose a topic related to the country where they plan to spend their student elective (undertaken after Final examinations) and the country profiles that they prepare for this work can be used in their elective reports. The countries that students examined were the United Kingdom (over a third stayed local for electives) and also, often reflecting student backgrounds, India, Pakistan, the United States and Australia. Countries where students planned to do their student electives included South Africa, Vietnam, Malaysia, Nepal and Hong Kong. In total presentations concerning 35 countries were given. Students are given over 30 hours during the firm to prepare their 'pitches' which they present in groups of 6–8 students with a tutor sitting in for assessment and discussion. Student feedback is very positive. As many countries improve their preventive and health care services finding obvious topics to choose is becoming more challenging. However, good health data shows differences between many countries and the challenge is to raise all to a better level. This is done against a background of many countries experiencing internal conflict, lack of resources, sometimes strict religious laws, social practices and customs and occasionally problems with corruption. The practicalities of Dragon's Den solutions is discussed with these in mind emphasising that medicine is both an art and a science.

Each year a small number of students seek our advice on how they can combine training both clinically and in public health so that they can provide care from an individual and population perspective. We feel that such doctors will have a transformative influence both for their medical and surgical specialties and also the National Health Service or wherever they choose to work.

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# 15. Educational transformation and the poster presentation of the incidence and management of anticoagulants in the HEMS population

*Rose Hall, Anthony Hudson*

## Abstract

This study, performed by a student in collaboration with a clinician, aims to transform and enhance the quality of care for patients assessed and transported by air ambulance. The project was a retrospective record audit which ascertained the number of anticoagulated patients attended in 2016, who had their anticoagulation with warfarin reversed with a Prothrombin Complex Concentrate (PCC); the gain in time to treatment for patients; and the number of attendees prescribed a Novel Oral Anticoagulant (NOAC). Throughout 2016, the air ambulance attended 1,614 patients, and 2% of these were identified as taking warfarin. Of these patients on warfarin, 40% were reversed, all of which had an International Normalised Ratio >2. Patients on NOACS were 0.43% of attendees. This project highlights the transformation of medical education by the involvement of a medical student in a real time quality initiative, and highlights the transformation in clinical care, as new clinical innovations become available for implementation.

## Keywords

Air ambulance; anticoagulation; time to treatment; NOACs

## Poster

Available to view <https://doi.org/10.24376/rd.sgul.6249641.v1>

## Reflective commentary

Transformation in healthcare is essential to optimising the service delivered to patients. In this project, 'transformation' refers to implementing improvements to clinical care. In order to achieve gains in clinical care, educational transformation is necessary for delivery of the changes to the systems that deliver services. Service adjustments then need evaluation to ensure the predicted achievements are gained. However, by travelling one step further, by implementing further adjustments using such evaluation data, demonstrates commitment to a dynamic transformational and educational impetus. Such dynamic transformation

reinforces in practitioners the benefit of reflection and encourages the constant striving to enhance what we do. This is educational transformation at its best.

This audit was conducted in 2017 with Kent Surrey Sussex Air Ambulance (KSSAAT), entitled 'Incidence and Management of Anticoagulants in the HEMS Population'. Rapid reversal of warfarin in trauma victims saves lives. As can be seen from the poster, approximately 1.25 million people are prescribed anticoagulation in the UK (1), of which warfarin is still the most common. Thus, anticoagulated patients subjected to trauma are at a much higher risk of developing significant intracranial haematoma (2), with an increased risk for rapid deterioration and death. Emergency reversal of warfarin with Prothrombin Complex Concentrate (PCC) can slow or prevent the expansion of an intracranial haematoma before the patient reaches neurosurgical care (3). Reversal should be given as soon as possible to these patients in the pre-hospital phase, (providing that they satisfy the indications for use).

A previous KSSAAT audit in 2012 investigated the potential time that would be saved if PCC was available for use in the pre-hospital environment (which at that time, it was not). The audit concluded there would be a reduction in time for reversal if it were given on scene, and as a result of this conclusion, KSSAAT decided to introduce PCC to their service. Therefore, in 2013 KSSAAT introduced the reversal agent PCC to their arsenal, so that it can be used on scene rather than only in hospital. This audit, performed three years after the PCC introduction, established exactly how much time this saved. The poster documents the method of the audit and how the data were used and interpreted. The main result is that, for those patients attended by KSSAAT in 2016 who were on warfarin and reversed with PPC, the average time saved by delivering reversal in a pre-hospital environment is 74 minutes. This is likely to be reflected in an improved patient outcome, which will be the subject of another audit which I intend to commence soon.

This is a prime example of educational transformation: the service being delivered by staff was assessed for potential improvements, so to improve patient outcomes. KSSAAT realised that the time elapsed between the incident and the patient reaching hospital, could be allowing anticoagulated patients with intracranial bleeds to bleed further and deteriorate, therefore reducing their chance of survival. KSSAAT acknowledged that this was potentially an unnecessary problem, so they instigated an investigation to establish if it was of benefit to reverse anticoagulation in the pre-hospital environment. The results were analysed and as a consequence, a decision was made to implement this change, the introduction of PCC, despite the additional cost of being £2000 per dose. The audit presented on Education Day, confirmed the anticipated benefit of this transformation. The dynamic impetus to educational

transformation is demonstrated by an extension of the project, when the 2017 audit also analysed the number of those in the HEMS population taking Novel Oral Anticoagulants (NOACs), which is the first time that this data has been obtained and reflects the rapidly increasing use of NOACs instead of Warfarin (back in 2012, NOACs were still in their early days of development). Ongoing educational transformation is adaptive to the needs and demands that the service contends with on a daily basis. This demonstrates that good practice is dynamic and forever evolving, by learning from experience and constantly seeking to improve.

# 16. Training Against Medical Error (TAME) - transforming medical education using medical error virtual patient cases

*Trupti Jivram, Luke Woodham, Ella Poulton, Jonathan Round, Terry Poulton*

## Abstract

The TAME project (Training Against Medical Error) is an EC funded project. It aims to train students against medical error by using Virtual Patients (VPs) in an interactive Problem-Based Learning setting. Institutions from Kazakhstan, Ukraine and Vietnam have transformed their medical curricula to include these VP cases. Partners adapted six paediatric medical error cases provided by St George's University of London, into their own language, healthcare and cultural setting. They then created six new cases in their chosen subject area and delivered these to their students. Assessment and evaluation data was gathered and is being analysed. Past studies have shown learning through error is a powerful learning tool.

## Keywords

Education; transformation; curriculum; virtual patients; medical error; problem-based learning; TAME

## Poster

Available to view <https://doi.org/10.24376/rd.sgul.5896675.v1>

Medical schools across the world are transforming their medical education to provide an educational experience for students which mimics real life situations and addresses the changing demands of the clinical workplace. St George's, University of London (SGUL) transformed its medical education in 2009 by introducing interactive Virtual Patients (VPs) into their Problem-Based Learning (PBL) curriculum. The cases are delivered online and prepare students for clinical engagement through participation in virtual scenarios where they can do no real harm. There are clinician options throughout the case where the students can decide how to proceed. Depending on their choice, they see the consequences of their actions. Allowing students to make mistakes and learn from these in a safe

environment has the potential to lead to an improved, deep learning experience in preparation for practice.

Since 2009, St. George's e-Learning Unit (eLU) has been working with partners from Europe (Czech Republic, Georgia, Greece, Sweden, Ukraine) and Central and East Asia (Kazakhstan, Vietnam) to help transform their more traditional medical curricula and have introduced interactive VPs and PBL into their training. These countries have implemented VPs in a PBL curriculum through the funded European Commission (EC) TEMPUS ePBLnet Project (<http://epblnet.eu/>). Following this, the Training Against Medical Error (TAME) (<http://www.tame-project.org/>) project, which started in October 2015 and completes in October 2018, co-funded by the Erasmus+ programme from the EC, takes the use of VPs in Medical Education a step further. The project has four main aims:

- Develop a Virtual Patient Methodology based on virtual case histories to avoid medical errors;
- Transfer knowledge and experience from leading institutions to partner countries;
- Use experience gained from past projects to create resources in clinical attachments at each institution;
- Share and disseminate findings via Medical Education networks such as ePBLnet and MEFANET and WAVES

A consortium of Higher Education partners from UK, Greece, Czech Republic, Kazakhstan, Ukraine and Vietnam are developing VPs to be used to train students against medical error in their institutions. Firstly, curriculums were transformed and adapted to include these VPs in the teaching modules, initially in the subject area of Paediatrics and then in a self-chosen subject area.

Partners repurposed six Paediatric VP error cases developed by St. George's into their own language, healthcare and cultural settings. Following this, partners also created cases in their chosen subject areas (some of the areas chosen included general practice, infectious diseases and surgery). Case writers in partner countries were provided with training on how to create and adapt VP medical error cases by the means of workshops and online sessions. The case writers took well to the process and were able to successfully create their own cases in the chosen subject areas. The partner countries were also provided with training on how to deliver these interactive VP cases. This included training on PBL, group dynamics

and how to facilitate an online interactive case. The 'train the trainer' approach was used and each institution then trained their own faculty members.

Alongside the development of the VP error cases, assessment and evaluation instruments were created for student learners who use the cases. These instruments are composed of questionnaires and surveys which were translated in to the native language of the institution. Data is in the process of being collected from student assessments and evaluation of the project. Initial findings have been informative; during the case adaption process partners noted that there were cultural differences in the terminology used. For example, 'A mother brings her child into the emergency department with her partner'. The key here is the word partner, which would not be understood in some cultures. In these instances, the word 'husband' must be used. Another example would be that in the UK we have statutory agencies such as social services and child protection for child safeguarding; whereas in some partner counties it is the sole responsibility of the parents to make sure the child is kept safe. If there is a suspicion of abuse or mistreatment when presented at the hospital, it is up to the parent/guardian to address this in these territories. These findings have provided an insight for case writers when writing cases, showing that what we would take as normality here in the UK differs in other countries, and cases may need to be modified to fit a direct translation of language and culture.

The project will conclude later this year and the findings will but made available via the project website. The project has already shown how curriculums can be transformed to include interactive online VP PBL cases to teach against medical error.



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