



# Hackathon Case Study.

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## What is AMEE Hacks?

A two-day medical education hackathon, which took place during the 2015 AMEE conference. Hand-picked developers, designers, medics and educators from Europe, came together to tackle challenges students and lecturers face in medical education. The objectives of the AMEE Hacks event consisted of the following:

- A solution oriented hackathon to address some of the challenges facing medical students and educators.
- A technology event that connected "Silicon Valley-minded" individuals with some of the largest players in medical education.
- An initiative that allowed medical education companies to see the creation of innovative solutions first hand.



Pictures during AMEE Hacks

## Challenges identified in Medical Education

**AMEE Hacks** identified common challenges within medical education and explored how technology can be used to solve them. Below is a sample of the challenges identified before and during the hackathon:

- Medical students are expected to learn and retain huge amounts of information, from a wealth of resources. Knowing what to use, when, and how to use these in the most effective way, can be very difficult.
- Medical students face continuous assessment, and the materials to help them prepare for these assessments are not always effective or address their individual needs.
- The majority of medical educators are not using technology to its full potential when creating teaching materials for students.

## AMEE Hacks Participants

### Criteria for successful applicants

Applicants were assessed by an expert panel from Hack Partners in two stages: an initial screening phase, and an interview phase.

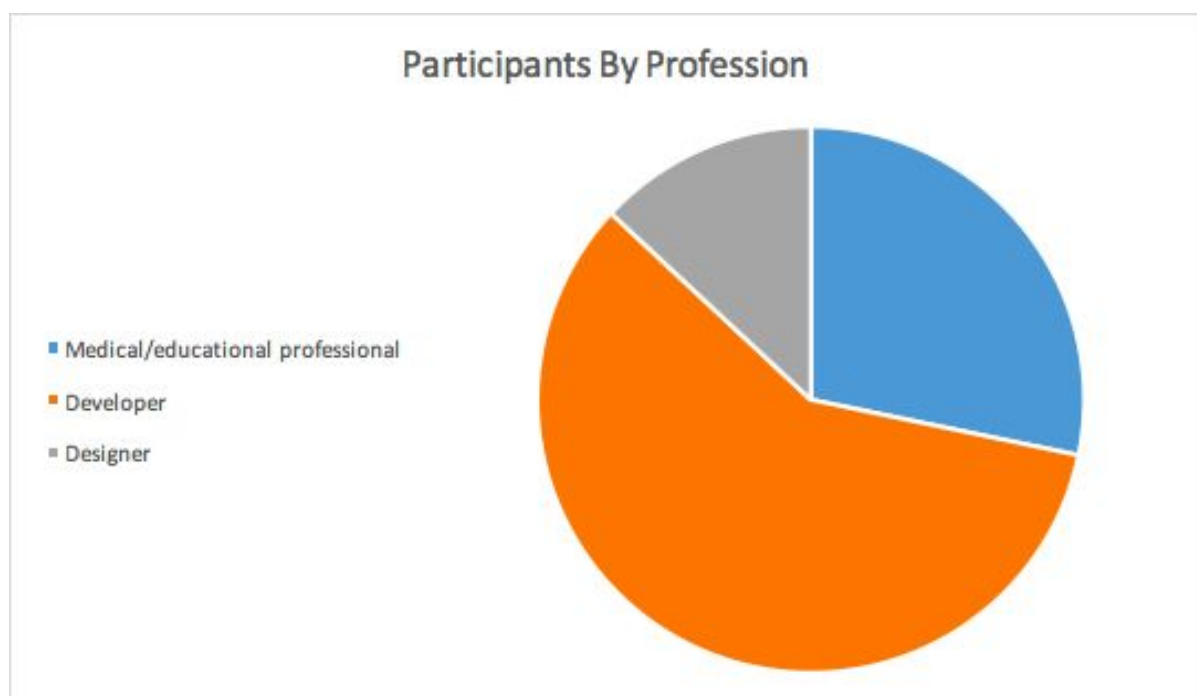
During the screening phase, applicants were rated on a scale of 1-5 based on the strength of their written application. For designers and developers, their portfolios were analysed and critiqued, based on the quality of websites and mobile apps they've built and designed in the past. For medical and education professionals, there was a greater focus on past projects and presentation skills.

For candidates who were rated a 3.5 or higher, an interview was scheduled in order to understand more about the individual, their specific skill sets and their reasons for taking part. During the interview, potential ideas were also discussed, and participants were given the opportunity to ask interviewers questions about the event itself.

### Participants by profession:

Out of 200 applicants, 46 participants were chosen. 13 were medical/educational professionals, 27 were developers, and six were designers.

As is standard at hackathons, the majority of participants had a background in software development. The developers come from outside the industry, and therefore bring the creativity. They are able to come up with innovative ideas because their thought process isn't restricted by the regulations and barriers that exist within the industry being innovated. It is then the job of the medical/educational professionals to validate the ideas, and guide the developers in making sure their ideas address existing challenges. It is the job of the designer to make sure the product is user friendly, and easy to navigate.



## What did AMEE Hacks 2015 consist of?

AMEE Hacks 2015 consisted of a fun and challenging 48-hour hackathon where Europe's best developers, designers and medics got together to create apps, websites and services that solved some of the biggest challenges in medical education. Throughout the 48-hours these innovators engaged with eLearning specialists and mentors, all of whom were able to provide insight into medical education, and also product guidance as solutions were made a reality.

## The route to innovate Medical Education

The structure of the event was key in ensuring that high quality ideas were developed. The teams only had 48 hours to form their idea and create their product, and in most cases, their fellow team mates were people they had never met before. The methodology of the event consisted of the following:



**Challenges Statements & Pitching ideas;** Sponsors presented challenges to the participants aimed at improving medical education. Attendees had a chance to share their ideas at the beginning of the event. These were 60-second informal pitches consisting of the challenge they wanted to solve and the rough solution they had in mind.



**Team Formation;** Attendees joined the team of the idea that resonated with them the most – being able to choose their team meant all members believed in the idea, had the passion to



build a fantastic prototype and had the skills that were relevant to the respective project. Short team workshops were carried out to facilitate this process.



**Hacking medical education;** As soon as teams were formed, the organisers and mentors encouraged the teams to introduce themselves to one another before getting to work on their projects. All attendees worked in an immersive environment, where they had the opportunity to engage with experts in the medical education industry. The development was supported by workshops, resources and support from the organisers and mentors throughout the weekend.



**Presentations;** After the intense 48 hours, AMEE Hackers were given the chance to present what they achieved in front of a panel of industry experts. Presentations consisted of the challenges they were tackling, their solution, a demo of their prototype, and the next steps for them to develop it further.



**Award ceremony;** This was the final stage, where the judges announced the winning teams. The best, most relevant and engaging ideas were selected as the winners of the hackathon. The decision was extremely hard, as every team had very strong ideas, with great execution. Feedback was given to all teams, prizes were awarded to the top three winners, and the three night stay in Amsterdam was awarded to the first place winner of the competition.

## AMEE Hacks 2015 Winners

A panel of judges consisting of industry experts and decision makers was formed to pick the top projects, and an overall winner. The judging criteria was based on products which truly brought innovation to medical education. Which single product stood above the rest in impact and potential?

### The judges of AMEE Hacks 2015

- **Stephen Downes**, Researcher at the NRC's Institute for Information Technology's e-Learning
- **Alan Ryan**, Technology Enhanced Learning Lead for HEE
- **Dr Michael Ross**, Senior Clinical Lecturer at The University of Edinburgh, General Practitioner and Co-Editor-in-Chief of The Clinical Teacher journal
- **Professor Madalena Patricio**, AMEE Past-President

The Judging criteria consisted of four areas:

- Impact in Medical Education -worth 40%
- Prototype - worth 30%
- Scalability - worth 20%
- Presentation - worth 10%

### OVERALL AMEE HACKS WINNER – Med Junkie

Team Med Junkie proved they understood the limited time medical students have to read and revise by building a mobile app that allows them to learn/revise topics/books through speed reading. Based on the time available, students can spend anywhere from 30 seconds to five minutes reviewing specific subjects on the go.

### ELSEVIER WINNER

Med Junkie

### E-LEARNING COMMITTEE WINNER

Team IMTS

### Additional Winners:

Best Developer : George Corney

Best Design : CrystalMed

Best Presentation : IMTS

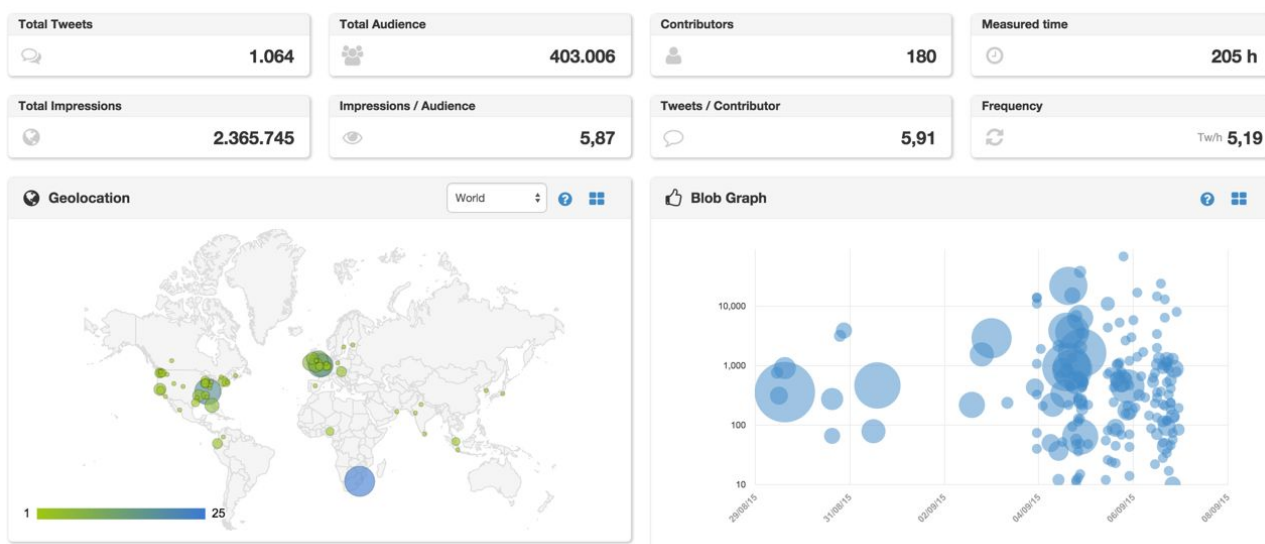
Most Innovative Person : Christopher Tse

Best use of Elsevier API / Data : Med Junkie

Best Medic: Uzair Adam

## Exposure and impact

Although the AMEE Hacks hackathon itself was limited to 46 participants, it attracted a much larger audience. Over the two-day event, the AMEE Hackathon managed to reach a massive audience online - with over 2,000,000 impressions, and a reach of over 400,000 different individuals around the world.



Metrics showing exposure during AMEE Hacks

## Social Media Engagement

The event prompted engagement from many **senior members** from the medical education industry, from all over the world:



**fredtrotter**  
@fredtrotter

(in)famous #HealthIT expert and #Data Journalist. Mostly because I wrote Hacking Healthcare book: [oreil.ly/rnwwan](http://oreil.ly/rnwwan) and started [careset.com](http://careset.com)

📍 Houston, TX



**Lawrence Sherman**  
@meducate

Global medical education futurist, TEDx, FutureMed & keynote speaker, mediquette/customer service in medicine, mentor, dad, comedian, runner, Brooklynite

📍 New York



**Rakesh Patel**  
@rakeshspatel

NIHR ACL in Medical Education/SpR Renal Medicine. Interested in clinical diagnostic decision-making, the learner, success, failure, being a doctor and being me.

📍 Leicester, United Kingdom



**Sample tweets:** (for more tweets, see appendix)



#### Additional Key Twitter Statistics:

- #ameehacks is still active on Twitter three weeks after the event started
- 1519 tweets were posted
- Tweets about AMEE Hacks were retweeted 795 times

Media exposure included **feature pieces** on Elsevier Connect, Glasgow City of Science, PRNewsWire, News Medical, and Tripple News.

## APPENDIX

### Challenge tackled, solution built and obstacles overcome by a selection of the teams during AMEE Hacks

N.B: The team members who are marked with an asterisk\* are in attendance today

#### Med Junkie

##### Challenge Tackled

1. How do you navigate through a vast number of resources, to extract the content you require?
2. Once you have found the content you require, how do you consume, and learn this in the most efficient manner?

##### Solution Proposed

We've built a personalised, time-bound educational platform, leveraging speed-reading for content delivery. The learning experience is enhanced through regular content related questions.

##### Obstacles overcome during the hackathon

1. Extracting the most relevant, and effective content.
2. Displaying the most relevant set of questions, based upon the steamed content.

##### Team

\*Lewis Tuff, Developer - mail@lewistuff.com

\*Izz Abudaka, Developer - izz.abudaka@gmail.com

\*Sami Alabed, Designer - sami.alabed@student.manchester.ac.uk

Bartek Siemieniuk, Developer - brave.pineapple@gmail.com

#### Anatomy Academy

##### Challenge Tackled

Learning anatomy and pathology. Such subjects are core foundations that lead to more complex medical fields. Less time is allocated to such subjects and more focus is put to self learning. The limited amount of time of medics with the lecturer should be enhanced with technology to make it a more immersive experience. Current models aren't intuitive and are difficult to work with, i.e. modify, annotate or ask questions about 3D anatomy: and these specific models are hard to find for free, existing solutions that have full anatomy don't let you easily modify, annotate, share or 3D print; all in one platform

##### Solution Proposed

We've built a browser based anatomy system that can be used on PCs/laptops/tablets, with the ability to add notes, draw on the models, allow feedback from user input and the ability to 3D print; all in one system. Anatomy Academy makes it easy to work with anatomy so that

it can be used in homeworks or discussions. Educators can quickly modify the anatomy and then print or send to the class. Questions can be asked and answered immediately to give an immediate assessment of how well the students understand the content of the lecture/module.

### **Obstacles overcome during the hackathon**

There is a lot of competition for each individual aspect of the browser we are providing. We assessed and pivoted and created an elegant platform for multiple uses. We are the only piece of software that combines all the benefits into one suite (3D anatomy+annotations+feedback from user input+3D printing). Currently, we are still designing ways for a user to effectively use the web browser on a phone. We need better anatomical models to input into the software. The ability to 3D print is still being decided as either being done by an external company or in-house.

### **Team**

\*Christopher Tse, Biomedical Engineer - christseacademic@gmail.com

\*George Corney, Developer - haxiomic@gmail.com

Matt Ross, Biomedical Professional - matthew\_ross2001@hotmail.com

Toldi Gergely, Designer - toldigergo@gmail.com

## **IMTS**

### **Challenge Tackled**

Many of the complaints brought against the NHS are caused by poor communication by health service staff, costing the NHS millions of pounds in legal costs each year. At some point in every doctor's professional journey, they will have to go through delivering traumatic news. The way students are currently taught is with actors, which is not cost effective and limiting for a number of reasons. There is currently no standardised way to train communication skills on demand.

### **Solution Proposed**

The IMTS is an immersive medical training system, which trains medical student's communication skills such as delivering bad news, or dealing with clinical mistakes.

The system utilises an immersive virtual environment, in which users can practice communication with a virtual patient. Student's book into a time slot and are briefed with a scenario, related to their courses. Whilst inside the training suite, each student is prompted with a set of possible phrases. The IMTS recognises the phrases student says out loud, and the virtual patient responds to accordingly.

Whilst patients train the IMTS, a camera records their reactions and can be reviewed at a later date.

As users interact with the virtual patient, every response is recorded and presented in an easy to use analytics interface to measure student improvement. This requires no additional computing skills and can be operated without supervision.

The IMTS eliminates the recurring cost of actors, standardises communication training and provides on demand access to measure student progress.

**Obstacles overcome during the hackathon**

Scenarios cannot be created quickly. Time is limited and facial emotion recognition is not used in the demo.

**Team**

\*Edward Miller, Videographer - edwardrmiller100890@gmail.com

\*Yeshwanth Pulijala, Dentist - dr.yesh@gmail.com

Benedict Rodrigues, Computer Science Student - benedictrodrigues@gmail.com

Huiqing Tong, Computer Science Student - leslie090920@gmail.com

Uzair Adam, Medical Student - uzairadam@doctors.org.uk

**Med Off****Challenge Tackled**

Learning medical information can be long, tedious and at the end you don't know how sure you really are of what you've learnt.

**Solution Proposed**

An iOS app featuring multiple choice questions created from the Elsevier data bank. The user has to bet on the confidence in their answer at each question using between 1-10 coins.

**Obstacles overcome during the hackathon**

Parsing the XML files provided by Elsevier into usable formats proved to be a big challenge that took a while to solve.

**Team**

Ben Easton, Developer - beng000uk@gmail.com

Barry Wong, Data Scientist - bhcdwong@yaoo.co.uk

Waqas Arshid, Technology Analyst - waqasa92@gmail.com

\*Gil Goldman, Robotics and Cybernetics Student - gilgoldman@gmail.com

**Code Blu****Challenge Tackled**

There is currently no widely used platform to discuss questions and answers with other medical students from a range of universities/ the world. Platforms that exist are restrictive, only allowing discussion between first years (for example) without the input from other years. Most sites are not mobile friendly and difficult to access whilst on the go. There is also little opportunity for other healthcare professionals, such as doctors and lecturers, to have an insight into which topic areas students find difficult across a range of medical schools.

**Solution Proposed**

A StackOverflow design for medical students to exchange questions and answers. This platform enables all healthcare professionals to sign up and ask/ answer questions. Every person asking the question must tag their question such as "renal"; "anatomy". Users searching for the topic of "renal" or "anatomy" are then able to browse these specific questions. There is a thumbs up and down feature which allows users to choose which answer is the most helpful and which they deem the best. Topics which are recently tagged are also shown indicating which topics fuel the most discussion.



## Obstacles overcome during the hackathon

We have incurred some difficulty in deciding the right server for this site. We need to ensure that it will be able to host a good amount of users.

## Team

\*Dominic Hauton, Designer - domhauton@gmail.com

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Bruce Taylor, Developer - brucetaylor88@gmx.com

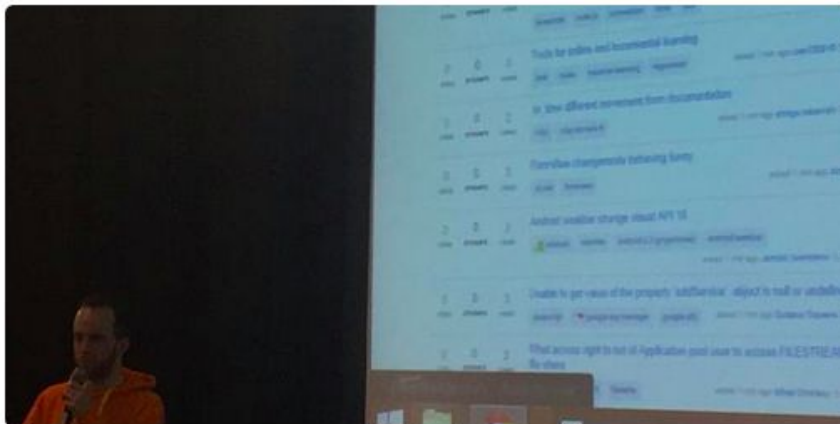
Angelica Sharma, Medical Student - [angelica\\_sharma@hotmail.co.uk](mailto:angelica_sharma@hotmail.co.uk)

## Additional Tweets



**Doctorpreneurs** @Doctorpreneurs · Sep 6

Next up: code blu- @StackOverflow for medics! #FOAMed #AMEEHacks #AMEE2015



← ↻ 4 ★ 4 ...



**Susan Kennedy** @AdaPeck · Sep 7

Brilliant - @Downes referring to #AMEEHacks as lively, enthusiastic & energetic - maybe in contrast to main conference! #amee2015

← ↻ ★ 3 ...



**Surgery 101** @surgery\_101 · Sep 7

#AMEE2015 @AMEEHacks here's one example of a small, successful, sustainable #meded project... [surgery101.org](http://surgery101.org)



← ↻ 2 ★ 3 ...



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## What is a hackathon?

Hackathons are innovation events, where small teams are challenged intensively to build apps, websites, software and hardware, that solve burning challenges in an industry. Teams of programmers, designers and industry experts come together in a 48-hour mission to build products from scratch and innovate a specific theme, or industry.

## What does the term “Hacking” mean in hackathons?

By definition, “A hacker is one who enjoys the intellectual challenge of creatively overcoming and circumventing limitations of programming systems, and who tries to extend their capabilities”. In the context of a hackathon, it means taking a piece of technology, and extending its functionality – by making it do incredible things that it was not traditionally made to do.

Unlike the “hacking” that you normally hear about in the news where individuals steal personal information, “hacking up ideas” is what hackathons are all about – building revolutionary products and services that solve challenges in innovative, unique ways.

## Hack Partners Contacts



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