**PDSA Cycle [1]**

**Aim:** what are you trying to accomplish?

The aim here was to test the package as a whole, to see what worked and what didn’t work, to test the logistics of getting the learners, teachers, and demonstration equipment to the right place and at the right time. As well as looking at the logistical issues, we hoped to actually make good on our promise of delivering high-quality teaching in order to increase buy-in from the senior GITU staff and anyone external to the core team who would be helping to deliver the teaching.

**Plan:** what will your test be?

The whole day was a test, both of the sum and of its component parts (see below). In order to gather useful data from the attendees, anonymous questionnaires were distributed individually that featured a Likert-type scale of responses to a range questions of questions concerning broadly three main areas: participants expectations of the course; the learning objectives and whether we had improved knowledge and confidence; and other variables relating to human factors.

**Prediction:** what do you think will happen as a result of your test?

On the day, hopefully a smooth running of the course! In terms of gathering data, questionnaires were distributed at three discrete time intervals – before the course, immediately after the course, and one month following the course (to assess the longer term effects of the intervention). Space for free text was included so that we could also take individual comments into account. We hoped for a good return rate so that we could more critically evaluate the course we had delivered.

**Do:** what happened when you carried out your test?

The proposal was to run the course as per the pre-devised curriculum, comprising of a mixture of didactic teaching, interactive workshops, and the running a number of scenarios using the simulator, with the first participants being the faculty in order to ‘ease in’ the learners, many of whom were new to the concept. All ten participants agreed to fill in the questionnaires, and there was a 100% completion rate for the surveys each time they were distributed. The offer of a course certificate as motivation to complete the final survey probably helped, though it was emphasized that neutral or responses were still welcomed as they were for the purposes of improving the course.

**Study:** how did the results of your test compare with predictions?

For this running of the course, global improvements were reported in all pre-defined learning objectives, both immediately post-course and one month post-intervention. Free-text comments were positive and constructive in nature, and we used them to help further refine future courses.

Our results confirmed to us that the learning objectives had been met by the scenario design and that there was definite 'buy-in' by staff and that some experiential learning had taken place – with course delegates reporting at one month that they had felt more confident managing head injured patients in their care since the course.

**Act:** how will you change your previous test in light of what you have learned?

We were happy that we were meeting the learning objectives we had set, but comments from the surveys showed that some staff found it difficult to get the course centre. We were delighted to be invited to the GITU itself by senior staff to deliver further teaching. This gave us the ideal opportunity to test our course in an ‘in situ’ location – a simulation technique held in the actual workplace of the delegates. This has been shown to further enhance team training, and can expose system-based latent risks to patient safety. We were interested to see how this might change the results of the data gathered during the next course.

**PDSA Cycle [2]**

**Aim:** what are you trying to accomplish?

The aim here was to see run the scenarios ‘in-situ’, again testing the logistics of getting the learners, teachers, and demonstration equipment to a different location and at the right time.

**Plan:** what will your test be?

This time the test was to see how well the course worked when run from the candidates’ usual place of work. As before, anonymous questionnaires were distributed individually that featured a Likert-type scale of responses to a range questions of questions concerning three main areas: participants expectations of the course; the learning objectives and whether we had improved knowledge and confidence; and other variables relating to human factors.

**Prediction:** what do you think will happen as a result of your test?

The hope was that as the simulation was being run in-situ, the candidates would feel more comfortable, and that the benefits of experiential learning would be increased.

**Do:** what happened when you carried out your test?

Less candidates were able to attend due to the size of the intensive care cubicle, but they all reported an increase in ‘believability’ when being taught in the same physical surroundings as they would look after real patients, which we saw as a success.

**Study:** how did the results of your test compare with predictions?

Although the number of feedback questionnaires returned was fewer, we again saw global improvements reported in all pre-defined learning objectives after the course. Free-text comments were again very useful, and comparable to those from the first study day.

Our results confirmed to us that the learning objectives continued to be met by the scenario design and that there was definite enthusiasm by staff for continued training.

**Act:** how will you change your previous test in light of what you have learned?

It is unlikely that we will alter the structure or content of future courses, but will continue to collect data for further PDSA cycles.

**PDSA Cycle [3]**

**Aim:** what are you trying to accomplish?

The aim of the third PDSA cycle was essentially to validate the results of the preceding cycles.

**Plan:** what will your test be?

The test was to replicate the delivery of the course in the ‘in-situ’ environment, with different learners, to see whether the same or similar levels of self-reported learning outcome improvement would be attained.

**Prediction:** what do you think will happen as a result of your test?

On the basis of the preceding cycles we felt that we would be able to run a successful course, and that the results gathered from the participants would again show an increase in their knowledge, skills, and confidence in the management of the head-injured patient on a general ITU.

**Do:** what happened when you carried out your test?

The course itself ran smoothly. Participants remained engaged and enthusiastic, and keen to learn.

**Study:** how did the results of your test compare with predictions?

Once more, comparison of self-reported scores on the pre-course questionnaires versus the post-course questionnaires showed improvements of, on average, 30% across the various learning objectives we had set.

**Act:** how will you change your previous test in light of what you have learned?

This last PDSA cycle validated for us that the course we had designed was doing what we intended it to do. We made no changes to the course content and subsequent courses continue to run along the same structure and delivery mechanism. We do however continue to distribute questionnaires so that as staff become more confident we can identify any changes in their perceived learning needs, or respond to feedback; making changes to the course as and when they become necessary to address these.