A systematic evaluation of SCRIPT eLearning: from theory to practice

Aiello M[1], Brooks HL[2], Pontefract SK[2,3], Hodson J[3], Blackwell N[4], Vallance HK[2], Marriott JF[2], Ferner RE[2], Hughes E[1], Coleman JJ[2,3]

[1]Health Education England   [2]University of Birmingham   [3]University Hospitals Birmingham NHS Foundation Trust   [4]OCB Media Ltd

Background and Objectives

The General Medical Council's EQUIP study[1] found that Foundation trainee (i.e. those in their first two years following medical school) doctors are responsible for the majority of prescribing errors in UK hospitals. Recommendations from the study were:

- *Education in practical prescribing should be part of Foundation education.*
- *Foundation trainees should be given explicit feedback regarding their prescribing practice.*

In response to the report, **Health Education England (West Midlands' Team)** commissioned a web-based eLearning programme to standardise prescribing education for trainees in the region. SCRIPT was developed in 2010 by a team of clinical pharmacists and clinical pharmacologists working in both education and healthcare.

The programme, accessible online at www.safeprescriber.org consists of 46 modules relating to prescribing and therapeutics across a wide range of subject areas. In the West Midlands, the learning is fully integrated into the Foundation programme[2], with trainees required to complete 16 core modules in the first year (F1) and a further 15 in the second year (F2).

Results → Comparison of medication incident reporting rates between a region using SCRIPT and a region without SCRIPT

Behaviour → Focus groups at three hospitals in the West Midlands

Learning → Comparisons of pre- and post-test scores for Foundation Trainee doctors in the West Midlands

Reaction → Focus groups at three hospitals in the West Midlands / analysis of trainees' learning behaviours

Figure 1: Summary of SCRIPT eLearning evaluation projects

Each module comprises a pre-test of 10 questions, designed to allow the trainee to determine their baseline knowledge on the subject area, followed by the main module content taking approximately 30 minutes to complete. At the end of the module, the trainee is presented with the same 10 questions (in a random order) and optional further reading.

SCRIPT has a learning management programme that enables clinical tutors and system developers to monitor the engagement, progress and knowledge of trainees. The ongoing evaluation of SCRIPT (summarised in Figure 1) is important to inform commissioners and developers of its impact on patient safety, trainee knowledge and also return on investment.

OBJECTIVES

The objectives of the evaluation are as follows:

- To examine users' **perceptions** of SCRIPT and their **learning behaviours** in the eLearning environment.
- To evaluate the impact of SCRIPT on prescribers **knowledge** and perceived impact on prescribing in **clinical practice.**

Study 1: Learning Behaviours

METHOD

The following information was captured from the SCRIPT management programme for each of the 16 mandatory modules completed by each of the 688 F1 trainees in the West Midlands from 01 August 2013 to 31 July 2014:

- Date module completed and time taken to complete modules;
- Pre/post test results; and
- Module factors (word count; number of images; number of external web links available).

To account for within-doctor correlations in the times taken to complete modules, data were analysed using Generalised Estimating Equations (GEE) with an exchangeable correlation structure.

RESULTS

Over the 12-month study period, there were 10,255 interactions with the 16 mandatory modules (approx. 200 per week). The average time taken to complete a module was 32.9 minutes.

The minimum number of modules completed in one week was 21, whilst peaks of 622 per week and 558 per week were observed in late February and early June, respectively. These peaks coincided with troughs in the time taken to complete modules (Figure 2), and occurred directly prior to bi-annual progression reviews.

Compared to weekdays, there was an increase in the frequency of modules completed (a total of 2,107 modules compared to a total of 1,500 modules) and time spent on the learning (38 minutes compared to 35 minutes) on a Sunday.

DISCUSSION

These findings suggest that progression reviews may serve as the extrinsic motivating factor for some trainees to complete modules, as opposed to intrinsic motivation. Nonetheless, it appears that trainees were still prepared to dedicate more time to modules over weekends, which was likely to be during their free time, rather than during protected study time.
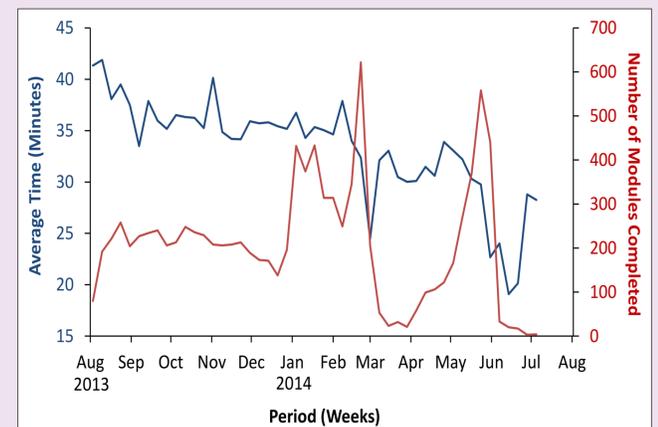
Figure 2: Graph to show frequency of module completion and time taken completing modules

Study 2: Reaction and Behaviour

METHOD

To explore Foundation trainees' perceptions of SCRIPT and their perceived impact on prescribing in clinical practice, we conducted focus groups and interviews with 38 trainees at three hospital sites across the West Midlands.

The focus groups/interviews were recorded and transcribed verbatim. Thematic analysis was completed by two researchers, who first independently developed and subsequently collectively reviewed a coding scheme. Codes were then reviewed by an expert group of clinical practitioners comprising medics and pharmacists. Each transcript was viewed by both researchers and at least two clinicians.
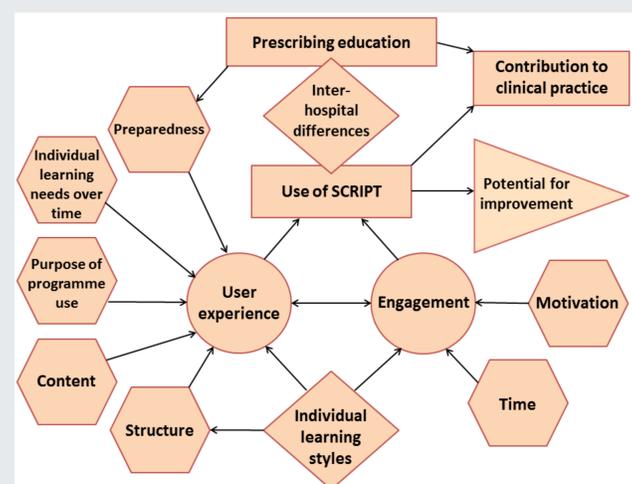
RESULTS AND DISCUSSION

Participants experienced formal and informal undergraduate and postgraduate prescribing education. SCRIPT was viewed as a supplementary part of formal learning.

In general, the content was perceived to be useful, though some modules were identified as irrelevant for Foundation trainees. The mandatory nature of modules and available time to complete modules affected engagement with the programme. A number of improvements to the structure and integration of SCRIPT were suggested. A schematic representing the main themes is displayed in Figure 3.

Figure 3: Schematic display of main themes in reaction and behaviours study

Conclusions: From Theory to Practice

The SCRIPT eLearning programme standardises prescribing education at postgraduate level. Our evaluation, based on established theoretical frameworks, is informing recommendations for future developments and use of SCRIPT.

The analyses of trainee learning behaviours (Study 1), reactions and behaviours (Study 2) lead us to suggest that Foundation trainees should be provided with a structured learning plan throughout their two-year training period to encourage regular use of the programme and to prevent bi-annual reviews being the motivating factor to complete the modules. If possible trainees should be provided with protected time during paid employment to complete SCRIPT modules.

These findings will be used to inform future research streams, commissioned by Health Education England, in which we will:

- Examine changes in trainees' prescribing knowledge using test scores as a surrogate measure of knowledge acquisition.
- Investigate the rate of medication errors and serious untoward incidents relating to medicines in the hospital setting using patient safety incident reports.

This research will help educators to optimise the delivery of prescribing education at the postgraduate level. We hope that this will improve prescribing in clinical practice, to optimise the use of medicines to benefit patient care.

References

1. Dornan T *et al.* (2009). An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. EQUIP study. Available online at www.gmcuk.org
2. The UK Foundation Programme Curriculum. UK Foundation Programme Office (2010). Available online at www.foundationprogramme.nhs.uk
3. Kirkpatrick DL, Kirkpatrick JD (2006). Evaluating Training programmes: The Four Levels. 3rd ed. San Francisco, CA: Berrett-Koehler Publishers.