Searchaton: a gamified, team-based on-site teaching format for literature searching for medical students

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Abstract

The Medical Faculty and the University Medical Library of the University of Basel jointly developed a new learning unit called Searchaton. This learning unit aimed at providing knowledge for the point-of-care literature search in everyday clinical practice. To make this as practical and customer-oriented as possible, the faculty and library interacted closely with medical experts. During the Searchaton, the task was to translate a patient case into a clinical question and to find an answer to that question. The format combined collaborative working and gamification with an aspect of time pressure to better reflect everyday clinical situations. The participants benefited greatly from the intensive support and were able to assess their searching skills in the context of evidence-based clinical decision-making.

Key words: information literacy; education, medical; information storage and retrieval; play and playthings; cooperative behavior.

Background

Various standards, models, guidelines, position papers and frameworks on information literacy refer to collaborative and interpersonal aspects of information seeking, eg. the ACRL standards 3/6 (1) or the *scholarship as conversation* frame in the Framework (2). In general, the importance of teamwork and cooperation in research and in the medical profession is pointed out for prospective physicians – for example described in the collaborator role of the widely used CanMEDs model for medical curricula (3). However, collaborative working in information literacy teaching is only rarely implemented (4). We wanted to close this gap, and by developing our learning unit as a team challenge, a gamification element comes into play (5).

Many training sessions or tutorials in literature searching are (implicitly or explicitly) geared to the ideal of the most systematic and sensitive search – an aim that makes perfect sense for authors of reviews or research papers. For everyday clinical situations and in point-of-care settings, however, conditions for literature searching are different: under time pressure, physicians must as quickly as possible find a reliable and evidence-based solution on how best to treat a present patient.

The Basel medical curriculum constitutes core and elective courses in information literacy from the first to the fifth year of study (*Table 1*). We designed a new elective (i.e. non-compulsory) learning format called *medical information professional* (med.info.pro) (6). This format consists of two parts: A webinar and a "Searchaton". The 2-hour webinar can be attended by every student and includes a hands-on searching tutorial. Attending the webinar is an admission requirement for the Searchaton. The Searchaton aims at teaching medical students how to implement searches in their clinical day-to-day life. For that, it combines collaborative working and gamification with the above-mentioned aspect of time pressure to better reflect everyday clinical situations.

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1st year	Lecture and hands-on-courses with online test on literature search: introduction to the library, library catalogue and databases, simple database searches
1st year	Lectures on epidemiology (statistical measures, study types; bias and confounding) and clinical epidemiology (randomisation etc.)
2nd year	Lectures and seminars on scientific competence and biostatistics; first orientation regarding the Master's thesis
3rd year	EBM block with lectures and hands-on-courses on clinical trials, meta-analyses, EBM sources (Cochrane etc.), critical appraisal
3rd to 5th year	Library-training (PubMed, EMBASE, Cochrane, EndNote, citing correctly **med.info.pro (webinar and Searchaton)** Individual counselling in literature search Journal Clubs Biostatistics online modules
5th year	Lectures and tutorials on abstract writing, peer-review of abstracts; academic writing and presentation skills

Table. 1. *Longitudinal curriculum scientific competence (selected courses with a focus on information literacy and EBM) in the medical study at Basel University (Switzerland).*

Implementation

After performing interviews with doctors and researchers at University Hospital Basel, the new 2-hour learning unit Searchaton was developed by two specialists: by a medical information specialist and the coordinator of medical studies at the medical faculty of the University of Basel. A practicing physician wrote a clinical case from the medical practice. The case was reviewed and piloted in a test run before we presented it to the students at Searchaton.

At the Searchaton, students were divided in four groups of 2-4, and presented with the patient case (*Figure 1*). Their task was to formulate the clinical

question in a PICO format (i.e. breaking the case down to the population, intervention, control, outcome) and to find evidence-based answers to their question. We deliberately did not give any instructions on how to tackle this task methodologically. The students had 50 minutes time for this task. Afterwards the clinical question and the search technique selected by the students were assessed by the jury (medical expert and information specialist) while the participating students were served a light snack in the cafeteria. The results of their assessment were then discussed in a plenary session. To add a competitive aspect, we offered a small prize to the team with the best solution.
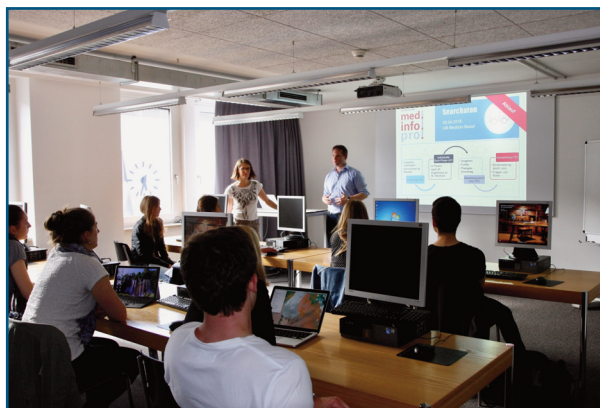
Fig. 1. *Searchaton session 2018 – briefing at the beginning of the session.*

After the Searchaton, each team was asked to revise their search strategy on the basis of the received expert feedback. The revised strategy was finally checked again and approved by the health librarian (*Figure 2*).
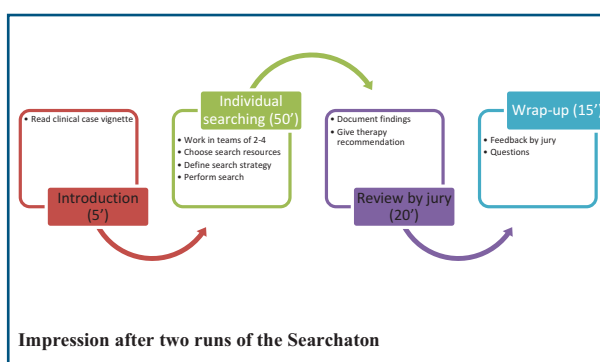
Fig. 2. *Timing and content of the Searchaton.*

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The Searchaton took place for the first time in 2018 and a second time in 2019. Each time, we allowed 12 participants. Attending staff included one medical expert and one medical information specialist

Although the methodological approach for the search was freely selectable, all students chose the same path: after familiarizing themselves with this topic on UpToDate or AMBOSS, they all used PubMed as the data source. This is the approach we focus on mostly in other literature search courses.

The students found this new teaching format very useful. However, they experienced the time constraints given for the search as rather challenging and not all students came to an evidence-based decision within in the given time. Another difficulty was the formulation of an exact clinical question in the PICO format.

The presentation of our feedback to each group's search strategy in the plenum was perceived as very valuable. Students took the opportunity to "challenge" our feedback and ask specific questions – which added to their learning experience.

The Seachaton is a valuable source to teach medical students how to make use of search techniques in real-life situations. The participants benefited greatly from the intensive support and appreciated the integration of knowledge from previous literature search courses and clinical decision-making into one learning format. However, the current format is resource-intensive: two experts were needed to review the search strategies of four groups and give feedback on all group's solutions within the session.

Outlook

The Searchaton was limited to a small group size. To allow more students, we would need either more time or more staff or offer several courses each year. As the Searchaton is one of several elective courses, we believe that the group size restriction is not (yet) an issue as so far all students who registered did get to participate. It is our intention to repeat this course again in 2020, however, with a slight adaption: When briefing the students for their task, we will give them the tip to focus less on sophisticated searches but more on a sound clinical question and on the use of clinical queries or simple searches.

The translation from theory to practice was one of the greatest difficulties for our participating students. We will certainly have to implement more "real-life" simulations in the curriculum in the future. Foremost, we will explore the possibility of adding another course with focus on the translation of patient cases to sound clinical questions.

Furthermore, the gamification approach seemed to resonate with the attending students. This gave us inspiration and motivation to implement more gamified and active courses in the future.

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