Are students learning what educators intend them to learn? A mixed-methods comparative analysis of lessons reported on student case logs from live vs. online (CLIPP) cases

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**Background:** Experiential learning is essential in undergraduate medical education. Learning from real patients provides authenticity; however, ensuring a diverse caseload is not always feasible at all clinical sites. Students at our institution are required to complete a case log during pediatric rotation. They satisfy this requirement with either live patient encounters or online cases (CLIPP). While online cases are standardized in content and stated objectives, it is unclear if 1) students actually learn lessons stated in the objectives; 2) lessons from live encounters and online cases align.

**Summary of Work:** In addition to submitting case log, students were asked to respond to this prompt: “List 3 things you learn from this case.” Investigators extracted responses from the 2010-2012 academic years and examined them for degree of overlap with stated objectives for corresponding online cases. For lessons that did not match the stated objectives, investigators perform thematic analysis to identify emerging themes.

**Summary of Results:** Of the 191 students completing the rotation during the study period, a mean of 154 (80.6%) responded to the prompt. Students logging online cases reported lessons that overlap the stated case objectives by 87.5%; whereas those logging live encounters reported overlap by 33.3%. Ongoing qualitative analysis of lessons from live encounters not matched to corresponding case objectives identified the following preliminary themes: professional responsibilities, approach to learning, communication, psychosocial dimensions, and system-based issues.

**Discussion and Conclusions:** Lessons students reported to have learned from live patient encounters match only one-third of those stated in corresponding online cases. Many of the non-overlapped themes were related to psychosocial aspects of care and students’ personal growth/professional development. Theses findings can potentially help educators improve the design of online cases to maximize educational impact.

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A scenario based Virtual Patient program to support pharmacist education

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**Background:** In Scotland, substance misuse services are provided by community pharmacies. Suitable practitioners’ education is essential. Virtual patient (VP) technology is a novel educational approach.

**Summary of Work:** Scenario based VP programs for Injecting Equipment Provision (IEP) and Opiate Substitution Therapy (OST) services were developed and evaluated. 106 pre-registration pharmacists participated and undertook knowledge tests and perceived confidence assessments before (pre) and immediately after (post) (n = 106, 100%). Assessments were repeated at six months (n = 46, 43.4%).

**Summary of Results:** Perceived confidence increased statistically significantly in all domains. There was an improvement between pre and post scores for IEP (Z = 5.78, P < 0.001) and OST (Z = 5.93, p < 0.001) and for pre and 6 months test scores for IEP (Z = 2.62, p < 0.0167) and OST (Z = 4.75, p < 0.001). There was a decrease between post test and 6 months test scores (IEP, Z = 5.50, p < 0.001: OST, Z = 5.76, p < 0.001).

**Discussion and Conclusions:** VP programs increase pre-registration pharmacists’ knowledge immediately after using and at six months. There was a gradual loss of clinical knowledge over time while confidence in the cultural change was sustained. The VPs were successful at increasing knowledge and improving confidence and empathy in a challenging patient group. This method could be developed for other patient groups.

**Take-home messages:** VP programs can be used effectively to train professions with regard to patient safety, especially with vulnerable patient groups.
Use of a serious game for teaching diabetes in PHC

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**Background**: Medical education has been in transition from a traditional model of education for methodologies fitted in virtual platforms. The use of serious games has been an important tool in the teaching-learning process of medical students for presenting content in an engaging and enjoyable way.

**Summary of Work**: The purpose of this study was to develop a serious game for education in diabetes management at Primary Health Care. The game was developed in Unity platform and will be available to medicine undergraduates in WEB platform. A virtual city was developed in the third dimension (Muiraquitã) to set the game. The game was developed using clinical cases with fictional characters of the city, the tree model of decision is used to deliver the content. Undergraduates will make anamnese, physical exam, additional examination, diagnosis and management of Diabetes patient. A score will be assigned according to the choices made during the simulation of care.

**Summary of Results**: The development of a serious game proved to be an alternative approach to diabetes education in PHC. The creation of a virtual city provided the context of clinical cases in Primary Health Care setting.

**Discussion and Conclusions**: The serious game provided interactivity between content and student, becoming a promising methodology for diabetes education in primary health care. A randomized clinical trial should be performed to analyze the effectiveness of serious game in learning process of medical students.

**Take-home messages**: This will be the first work that develops a serious game for Primary Health Care doctors.

Various approaches to case-based learning across the educational network MEFANET

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**Background**: MEFANET (MEDical FACulties NETwork) is a medical education network composed from 11 medical faculties and 4 faculties focused on health care and biomedical sciences in the Czech Republic and Slovakia. The present-day MEFANET organizes its own annual conference, publishes a scientific journal and collaborates with other bodies throughout Europe.

**Summary of Work**: Since 09/2014, an Erasmus+ project entitled CROESUS has been started and linked to MEFANET, concentrating on the value of clinical decision-making through innovative scenario-based learning tools. During 10-11/2014, teaching styles inside MEFANET were surveyed to examine instances of existing case-based learning (CBL) and to capture information relating to educational settings.

**Summary of Results**: Besides the most interesting findings from the survey, the contribution will present 4 different MEFANET’s efforts in creating advanced teaching and learning tools based on simulations: (i) AKUTNE.CZ interactive algorithms and SEPSIS-Q education scenarios are focused on the management of a wide range of acute patients and situations; (ii) PEDKAZ is a database of linear clinical cases in paediatrics following the principles of evidence-based medicine; (iii) E KAZUJISTIKY are virtual cases delivering branched learning objects focused on optimal diagnostic procedures; (iv) HUMMOD-GOLEM, is focused on integrative physiology modelling.

**Discussion and Conclusions**: Simulation-based medical education should not be perceived only from the perspective of emerging technologies. The educators inside MEFANET do not know much about the systems supporting CBL, although they have to create their own cases, and agree that CBL-like activities are needed.

**Take-home messages**: MEFANET provides an open access to many virtual cases, see http://games.mefanet.cz.
#7L5 (28186)
Implementation strategies for integrating a Virtual Medical Center into education and care algorithms for United States Veterans

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Background: The Veterans Health Administration, the largest integrated health system in the world, has launched a collaborative Virtual Medical Center (VMC) and learning environment. Capabilities include virtual clinics with integration of current telehealth technologies, cybraries for patients and healthcare team members with electronic resources and searchable medical content, serious medical games, e-learning platforms and conference venues.

Summary of Work: Development of an implementation strategy has required attention to the best ways in which the VMC can be synergistic with existing care models, decrease repetitive staff activities, increase dissemination of and participation in educational interventions, provide more effective education, capture activities for productivity measures, and be easy to navigate. Input from human factors engineers, clinicians, educators, and technology experts has been critical.

Summary of Results: Implementation plans include the development of five pilot projects characterized by the need for an educational intervention for patients or/and healthcare team members. The projects focus on areas of key clinical importance to Veteran health outcomes. The clinical areas include diabetes, sleep disturbances, congestive heart failure management, obesity, and preoperative care. Assessment strategies include a global assessment strategy and project specific outcomes.

Discussion and Conclusions: The Virtual Medical Center represents an important opportunity to provide integrated educational and care activities which spans geography, technological enablers and VA healthcare expertise. Multidimensional input from technology, business process, education and clinical experts is required to optimize the opportunities for enhancing competence and clinical outcomes.

Take-home messages: Thoughtful implementation of educational activities directed to the healthcare team and to patients can be integrated into care models using a rich avatar-based virtual medical center. Multilevel considerations and assessments are critical to knowing educational and clinical outcomes.

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Game-based or text-based cases: what do they add to instruction?

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Background: Simulation games can deliver instruction in a realistic, engaging way and are becoming increasingly popular in medical education. However, more insight in their effectiveness and design features is needed. This study investigated whether emergency skills and motivation of medical students can be improved by adding a text-based cases program or a simulation game to an e-module.

Summary of Work: We set up a randomized design with three groups: a control group working on an e-module, a cases group, combining the e-module with low-fidelity text based patients cases, and a game group, combining the e-module with a high-fidelity simulation game, based on the same cases. Participants completed a questionnaire on cognitive load and motivation. After a 4-week study period, assessors rated students’ emergency care skills in mannequin-based scenarios.

Summary of Results: In total 61 students participated and were assessed; 16 control group, 20 cases and 25 game students. Learning time was 2 hours longer for the cases and game groups than for the control group. Emergency skills did not differ between groups. However, students who spent more game-time showed better skills. The game group experienced higher cognitive load than the cases group and felt more engaged, with large effect sizes.

Discussion and Conclusions: Students with little expertise in emergency care do not profit from working on open cases (in adjunct to an e-module), which nonetheless challenged students to study longer. The high-fidelity game increased complexity and did not improve their skill-level, even though students put more effort into it and felt more engaged with it, compared to the low-fidelity cases.

Take-home messages: A simulation game offers a motivational learning environment. To improve skills, worked cases (e.g. video demonstrations) and open cases should be balanced with learner experience.