

Year report of the institute of Medical Education Research Rotterdam (iMERR) 2015

Introduction

The institute of Medical Education Research Rotterdam (iMERR) is a multidisciplinary, collaborative effort of the Faculty of Social Sciences, in particular the Department of Psychology, and Erasmus MC. The two faculties established iMERR two years ago. This effort was achieved by generous help of the Executive Board of the EUR as well as the dean of both faculties.

The iMERR group currently consists of 2.2 fte tenured staff for research and 6.0 fte temporary staff (2 post-docs, 3 internal PhD students, 10 external PhD students). Prof. Dr. Ir. A.P.N. Themmen is appointed as chair of the Advisory Board for iMERR. The advisory board advises the scientific director on strategic and policy decisions for the scientific programs. Mrs. Dr. S. Mamede is appointed as vice director of iMERR.

Overall research in medical education will focus on study success and quality of education based on evidence based medical education. To achieve this, collaboration not only with the faculty of social sciences is needed but also with other faculties and universities in The Netherlands, Europe and outside of Europe.

We will invest in partnerships and networks between disciplines in The Netherlands and other countries. Already collaborations with other faculties of medicine have started as well as contacts were established with Centre for Education and Learning (CEL) and Risbo, the research institutes of the EUR. iMERR organizes several innovation room meetings with LDE-CEL in the coming years.

In order to become visible and seen as a nexus for research in medical education we organized institute wide activities where people can meet and work with members of the group. Bi-weekly “lab meetings” are organized for those involved in research. Monthly colloquia are organized to which members of other faculties and disciplines are also invited. Several external speakers were invited for our monthly colloquia.

Key words: medical education, continuing medical education, admission test college, clinical clerkship, internship and residency, problem-based learning,

distance education, e-learning, clinical reasoning, minority recruitment.

Scientific publications in international journals

Wijnia L, Loyens SMM, Derous E, Schmidt HG (iMERR). How important are student-selected versus instructor-selected literature resources for students' learning and motivation in problem-based learning? *Instructional Science*, 43(1), 39-58. DOI: 10.1007/s11251-014-9325-6.

Badenhorst, E., Mamede, S. (iMERR), Hartman, N., & Schmidt, H. G (iMERR). (2015). Exploring lecturers' views of first-year health science students' misconceptions in biomedical domains. *Advances in Health Sciences Education*, 20(2), 403-420. doi: 10.1007/s10459-014-9535-3

Chamberland, M. (extern), Mamede, S. (iMERR), St-Onge, C., Setrakian, J., & Schmidt, H. G. (iMERR) (2015). Does medical students' diagnostic performance improve by observing examples of self-explanation provided by peers or experts? *Advances in Health Sciences Education*, 20(4), 981-993. doi: 10.1007/s10459-014-9576-7.

Chamberland M (extern), Mamede S (iMERR), St-Onge C, Setrakian J, Bergeron L, Schmidt H (iMERR). Self-Explanation in Learning Clinical Reasoning: The Added Value of Examples and Prompts. *Medical Education*. 2015;49(2):193-202.

Chng, Esther, Yew, Elaine H. J., & Schmidt, Henk G (iMERR). (2015). To what extent do tutor-related behaviours influence student learning in PBL? *Advances in Health Sciences Education*, 20(1), 5-21. doi: 10.1007/s10459-014-9503-y

Dyer JO, Hudon A, Montpetit-Tourangeau K, Charlin B, Mamede S (iMERR), Van Gog T. Example-Based Learning: Comparing the Effects of Additionally Providing Three Different Integrative Learning Activities on Physiotherapy Intervention Knowledge Approaches to Teaching and Learning. *BMC Medical Education*. 2015;15:37(1).

Hopmans W (extern), Zwaan L (iMERR), Senan S (extern), van der Wulp I (extern), Damman OC (extern), Hartemink KJ (extern), Smit EF (extern), Timmermans DR (extern). Differences between Pulmonologists, Thoracic Surgeons and Radiation Oncologists in Deciding on the Treatment of Stage I Non-Small Cell Lung Cancer: A Binary Choice Experiment. *Radiotherapy and oncology : Journal of the European Society for Therapeutic Radiology and Oncology*. 2015;115(3):361-6.

Lucieer SM (iMERR), Jonker L, Visscher C, Rikers RM, Themmen AP (iMERR). Self-regulated learning and academic performance in medical education. *Med Teach*. 2015 Aug 27:1-9.

- Schmidt HG (iMERR), Mamede S (iMERR). How to Improve the Teaching of Clinical Reasoning: A Narrative Review and a Proposal. *Medical Education*. 2015;49(10):961-73.
- Stegers-Jager KM (iMERR), Steyerberg EW, Lucieer SM (iMERR), Themmen APN (iMERR). Ethnic and social disparities in performance on medical school selection criteria. *Med Educ* 2015;49:124-33.
- Stegers-Jager KM (iMERR), Themmen APN (iMERR). Dealing with Diversity: Stepping Backwards to See the Whole Picture. *Med Educ* 2015;49:233.
- Stegers-Jager KM (iMERR), Themmen APN (iMERR), Cohen-Schotanus J (extern), Steyerberg EW. Predicting Performance: Relative Importance of Students' Background and Past Performance. *Med Educ* 2015;49:933-45.
- Stegers-Jager KM (iMERR), Themmen APN (iMERR). Binding study advice: effect of raising the standards? *Perspect Med Educ* 2015;4:160-2.
- St-Onge C, Landry M, Xhignesse M, Voyer G, Tremblay-Lavoie S, Mamede S (iMERR), Schmidt H (iMERR), Rikers R. Age-Related Decline and Diagnostic Performance of More and Less Prevalent Clinical Cases. *Advances in Health Sciences Education*. 2015:1-10.
- Weiland A, Blankenstein AH, Van Saase JLCM (iMERR), Van Der Molen HT, Jacobs ME, Abels DC, Köse N, Van Dulmen S, Vernhout RM, Arends LR. Training Medical Specialists to Communicate Better with Patients with Medically Unexplained Physical Symptoms (Mups). A Randomized, Controlled Trial. *PLoS ONE*. 2015;10(9).
- Weiland A, Blankenstein AH, Willems MHA, Van Saase JLCM (iMERR), Van Daele PLA, Van der Molen HT, Langbroek GB, Bootsma A, Vriens EM, Oberndorff-Klein Woolthuis A, Vernhout RM, Arends LR. Training Specialists to Write Appropriate Reply Letters to General Practitioners About Patients with Medically Unexplained Physical Symptoms; a Cluster-Randomized Trial. *Patient Education and Counseling*. 2015;98(10):1229-35.
- Wijnia L, Loyens SMM, Derous E, Schmidt HG (iMERR). How Important Are Student-Selected Versus Instructor-Selected Literature Resources for Students' Learning and Motivation in Problem-Based Learning? *Instructional Science*. 2015;43(1):39-58.
- Zwaan L (iMERR). The psychology of diagnostic error. *Экспериментальная Психология = Experimental Psychology (Russia)*, 2015;8 (3) 91-98 (In Russian, abstract in English)
- Zwaan, L. (iMERR), Singh, H. (extern), The challenges in defining and measuring diagnostic errors. *Diagnosis*, 2015;2 (2), 97-103

Promotion

Dr. Mary Dankbaar, Publications & Presentations 2015. Serious games and blended learning; effects on performance and motivation in medical education. MEW Dankbaar, PhD study, November 2015.

Ongoing PhD trajectories within the EUR

Situational Judgment Test for the Selection into Medical School (Wendy de Leng)

Wendy started her PhD in April 2014 under the supervision of dr. Karen Stegers-Jager (co-promotor), prof. dr. Axel Themmen (1st promotor) and prof. dr. Marise Born (2nd promotor). Her PhD-project is focused on selection into medical school using a Situational Judgment Test (SJT). During the selection procedures of 2014 and 2015, a first SJT originating from the UK was administered among the applicants for the Erasmus MC Medical School. This SJT, created to measure integrity, aims at extending the range of constructs on which medical students are selected. In addition, SJTs display lower ethnic subgroup differences than traditional cognitive tests and could thereby increase the ethnic diversity among medical students. The SJT was administered among a group of Subject Matter Experts (SMEs) in order to create a scoring key for converting the applicants' judgments into scores. Several types of scoring methods exist. Wendy's first study focused on the comparison of 28 different SJT scoring methods on reliability, ethnic subgroup differences and correlation with personality. This study resulted in a paper titled: 'Scoring method of a Situational Judgment Test: Influence on internal consistency reliability, adverse impact and correlation with personality?' and is submitted to *Advances in Health Sciences Education*. In addition, Wendy started with the development of a new SJT using a combination of empirical and theoretical development approaches. This new SJT has been administered to prospective medical students in two pilot studies. The data gathered in these studies is used to examine whether it is possible to develop an SJT that measures one clear theoretical construct. Rob Kickert, Department of Psychology, Education and Child Studies, FSW, EUR. Under the supervision of dr. Karen Stegers-Jager thesis theme: Academic performance, behavior and student characteristics under a renewed examination system

Recruitment and selection for a future diverse medical workforce (Lokke Gennissen, MD)

Lokke Gennissen started her PhD in July 2014, under supervision by Karen

Stegers-Jager, Matthijs de Hoog (Erasmus Medical Center), Lia Fluit and Jacqueline de Graaf (Radboud University Medical Center Nijmegen). In order to make a more fluent transition from undergraduate to postgraduate medical training and in that way pursuing an educational continuum a fast track program is introduced in the Netherlands. The fast track program is a program for last year medical students, where they can already acquire competencies at the level of first year residents in training in their specialty of choice. These acquired competencies enable a reduction of the duration of postgraduate training. In the context of these recent changes this PhD trajectory is focused on the specialism choice of medical students and the recruitment and selection of the future medical specialists. These recent changes confront students and (postgraduate) educators with an earlier decision moment. Students are confronted with an earlier specialism choice, while postgraduate educators are confronted with an earlier selection of students eligible for postgraduate training in their specialty. To address the lack of diversity in the medical specialty population, the focus in the studies concerning the specialism choice will be on the role of ethnicity, socio-economic class and gender. In her first study she will investigate the selection procedure of residents by interviewing both selection committee members and applicants regarding this selection procedure. In a second study she will look into prestige perception differences of medical specialties between Dutch and ethnic minority medical students and between first generation and not first generation university students.

Ongoing PhD trajectories outside the EUR

The following external PhD projects have been ongoing, since 2013, under the supervision of Prof.dr. Henk Schmidt, with dr. Sílvia Mamede as co-supervisor: Ligia Cayres Ribeiro, MG, general internist, UNIFENAS Medical College, Belo Horizonte, Brazil. Theme of the thesis: The role of reflection upon clinical experiences on medical students' learning. Bernard Martineau, MD, general practitioner, Faculty of Medicine, Sherbrooke University, Canada. Thesis theme: The influence of peers on medical students' learning of physical examination. Graduation date: November 2nd, 2016 Dalal Al Qahtani, dentist, Medical College, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Contextual factors influencing physicians' diagnostic performance. Daniel de Castro, MD, internist-endocrinologist, Faculty of Medicine, University of the State of Ceará, Fortaleza, Brazil. Theme of the thesis: Instructional approaches to foster medical students' clinical reasoning. Elmi Badenhorst, psychologist, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa. Theme of the thesis: Students' misconceptions in medical education Fathia Al Shaikh, MD, Medical College, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Patient's characteristics and physicians' clinical reasoning Manahil Mohamedani,

MD, Medical College, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Physician-related factors influencing diagnostic reasoning and diagnostic accuracy
Telma Kremer, psychologist, University of São Paulo, São Paulo, Brazil. Thesis theme: Students' emotions and learning in medical education.
Shaikha Hamed Al-Aujan, dentist, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Expertise in clinical reasoning in dentistry

Grants

In a joint project with the ErasmusMC general practice department, the iMERR clinical reasoning research group has won a ZonMw grant within the program "Huisartsgeneeskunde en Ouderengeneeskunde". Title of the project: Teaching reflective reasoning through modeling as a strategy to counteract diagnostic mistakes in general practice. Grant: 247.758,00; Duration: 3 years. Members of iMERR involved in the project: Walter van den Broek (co-applicant); Laura Zwaan (co-applicant); Henk Schmidt (co-applicant); Silvia Mamede (co-project leader).

Researchers in clinical reasoning from iMERR and the Nanyang Technological University school of medicine obtained a grant from the National Research Foundation, Singapore, for a joint research project. Title: A neuroscientific research programme on diagnostic reasoning in medicine: a proof of concept near infrared spectroscopy (NIRS) study. Grant: US\$ 65.000,00; Duration: 1 year; Members of iMERR involved in the project (research members): Henk Schmidt, Silvia Mamede, Laura Zwaan, Jerome Rotgans (associate member).

Projects

International

Joint studies on educational strategies for teaching clinical reasoning are presently ongoing in Belo Horizonte, Brazil, in a collaboration between the iMERR clinical reasoning research group and researchers of the Faculty of Medicine of the Federal University of Minas Gerais, Brazil, funded by local resources. Two studies are presently being conducted as follow-up of research carried out in Brazil as part of a research grant obtained from the CAPES-NUFFIC Program. The iMERR clinical reasoning research group (Henk Schmidt, Sílvia Mamede) have collaborated with researchers from the McMaster University, Canada, (e.g., co-writing the chapter on medical expertise for The Cambridge Handbook of Expertise and Expert Performance for the Handbook on Professional Expertise, edited by K. Anders Ericsson) and the Sherbrooke University (application for a research grant to implement studies on the use of self-explanation as an instructional approach in clinical teaching). The iMERR clinical reasoning research group (Laura Zwaan) collaborates with

the university of McMaster University, Canada, and the University of Washington (USA) on a project on cognitive biases in clinical reasoning. The data-gathering is currently ongoing. The project will result in a joint publication. The iMERR clinical reasoning research group (Laura Zwaan) collaborates with Dr. Hardeep Singh (Houston Veterans Affairs Center for Innovations in Quality, Effectiveness and Safety and Baylor College of Medicine, Houston, Texas) on several papers regarding measurement of diagnostic error. This resulted in one paper that is in press and one paper that is currently in preparation.

National – Internal

Relation between biological and psychological stress and well-being, and academic performance (Karen Stegers-Jager & Andrea Woltman). This pilot study aims to investigate the relation between chronic psychological and biological stress levels and academic performance. For this project two (unsuccessful) grant proposals have been submitted in 2015. The Erasmus MC Grants, pilot study (January). Title “Relation between biological and psychological stress and well-being, and academic performance” and REI 2015 (August). Title: Relation between student characteristics, academic progress policies, psychological and biological chronic stress and academic outcomes. Furthermore, both student-related factors as well as school-related factors will be studied that may influence stress levels, academic performance and students’ well-being as defined by time use, including extracurricular activities, and (absence of) conflicts between life domains (study, family, work, leisure time). Chronic psychological and biological stress levels, as measured by psychological stress questionnaires and hair cortisol concentrations respectively, and academic performance of the last medical student cohort entering before and the first cohort entering after the implementation of a strict academic dismissal policy will be compared. In this project we collaborate with the Section Endocrinology of the Department of Internal Medicine, and with the Section Pedagogical Sciences of the Faculty of Social Sciences of the EUR.

Research project on the sources of cognitive diagnostic errors and strategies to minimize them (Henk Schmidt, Sílvia Mamede, Laura Zwaan): during 2015, a new study aimed at exploring strategies to counteract cognitive biases was prepared in collaboration with the department of Internal Medicine; data collection is presently ongoing.

iMERR and the general practice department have worked together on a project to improve teaching of clinical reasoning in the bachelor phase. A new format for the course was designed by the GP department and has been tested in 2015. The iMERR clinical reasoning research group has provided technical support for the investigation of the effects of the new format on students’ learning and satisfaction. A scientific article reporting on the study is presently in preparation.

Research project on educational strategies to the teaching of clinical reasoning (Henk Schmidt, Sílvia Mamede, Laura Zwaan): together with the coordination of the clinical reasoning teaching, two studies aimed at investigating the relative benefits of different teaching strategies were conducted in 2015, with 2nd-year and 4th-year students. Data analysis is presently ongoing.

Collaboration (international/national)

Research group 'Dedicated Schakeljaar' (NFU/ all Dutch medical schools)
InReSH (International Network for Researchers in Selection into Healthcare)
Dutch Flemish network of Researchers in Personnel Recruitment and Selection

Research reputation

Ad hoc reviewing.

In 2015, the iMERR researchers worked as ad hoc reviewers:

- For the top medical education journals (Medical Education, Academic Medicine, Advances in Health Sciences Education and others) and general higher education journals (Studies in Higher Education and others) as well for manuscripts on medical education submitted to top medical journals (JAMA, BMJ, BMJ Q&S, Annals of Internal Medicine)
- For the American National Academies of Sciences, Engineering and Medicine which is a leading nonprofit institution that provide independent, objective analysis and advice to the American government.
- For international medical education conferences (Association for Medical Education in Europe- AMEE conference, Diagnostic Error in Medicine conference), including grant reviewing.

Presentation in national and international conferences

Research conducted by the iMERR members and by internal and external PhD students was presented at the 2015 NVMO, ORD, AMEE, the Diagnostic Error in Medicine, Medical Image Perception and NAEDI conferences.

Conference organization

Mrs. Dr. Laura Zwaan is on the planning committee of the international Diagnostic Error in Medicine conference (2015 in Washington DC) and the chair of the Diagnostic Error in Medicine, 1st European conference which will take place in 2016).

Positions in professional society

Mrs. Dr. Laura Zwaan is the chair of the research committee of the Society to Improve Diagnosis in Medicine. She is chairing monthly meetings with a group of 15 expert researchers in the field of diagnostic error.

(<http://www.improvediagnosis.org/?page=Committees>)

Editorial Board

Mrs. Dr. Laura Zwaan is on the editorial board of Diagnosis. Dr. Walter van den Broek is on the editorial board of the Dutch Flemish Journal of Psychiatry and Current Drug Therapy. Dr. Silvia Mamede is on the editorial board of Health Professions Education.

Fellows

- Prof. Dr. Matthijs de Hoog, MD, PhD
- Mrs. Dr. Silvia Mamede, MD, PhD, co-director of iMERR
- Prof. Dr. Ir. Axel Themmen, chair of the advisory board of iMERR
- Mrs. Dr. Karen Stegers-Jager, PhD, member advisory board iMERR
- Mrs. Dr. Andrea Woltman, PhD, member advisory board iMERR
- Prof. Dr. Henk Schmidt, PhD, member advisory board iMERR
- Mrs. Dr. L. Zwaan, PhD, member advisory board iMERR

Associate members

- Jelmer Alsmas, MD
- Prof. Dr. Patrick Bindels, MD, PhD
- Dr. Herman Bueving, MD, PhD
- Mrs. Dr. Mary Dankbaar
- Mrs. Dr. Stephanie Klein Nagelvoort-Schuit, MD, PhD
- Prof. Dr. Els Berns, PhD
- Dr. Jerome Rotgans, PhD.

Honorary members

- Prof. Dr. Geoff Norman, PhD

Societal impact

Karen Stegers-Jager & Axel P.N. Themmen. Gekozen studenten vallen minder vaak uit en zijn actiever. NRC handelsblad March 7th, 2015.

Invited workshop Prof. Dr. Ir. Axel Themmen & Dr. Karen Stegers-Jager at VSNU conference “De loting voorbij” on Decentrale selectie – Erasmus MC Niet alleen maar blonde meiden November 11th, 2015 in Amstelveen.

Invited presentation Prof. Dr. Ir. Axel Themmen & Dr. Karen Stegers-Jager at Symposium “Een enkeltje Rotterdam” October 27th, 2015 in Rotterdam.