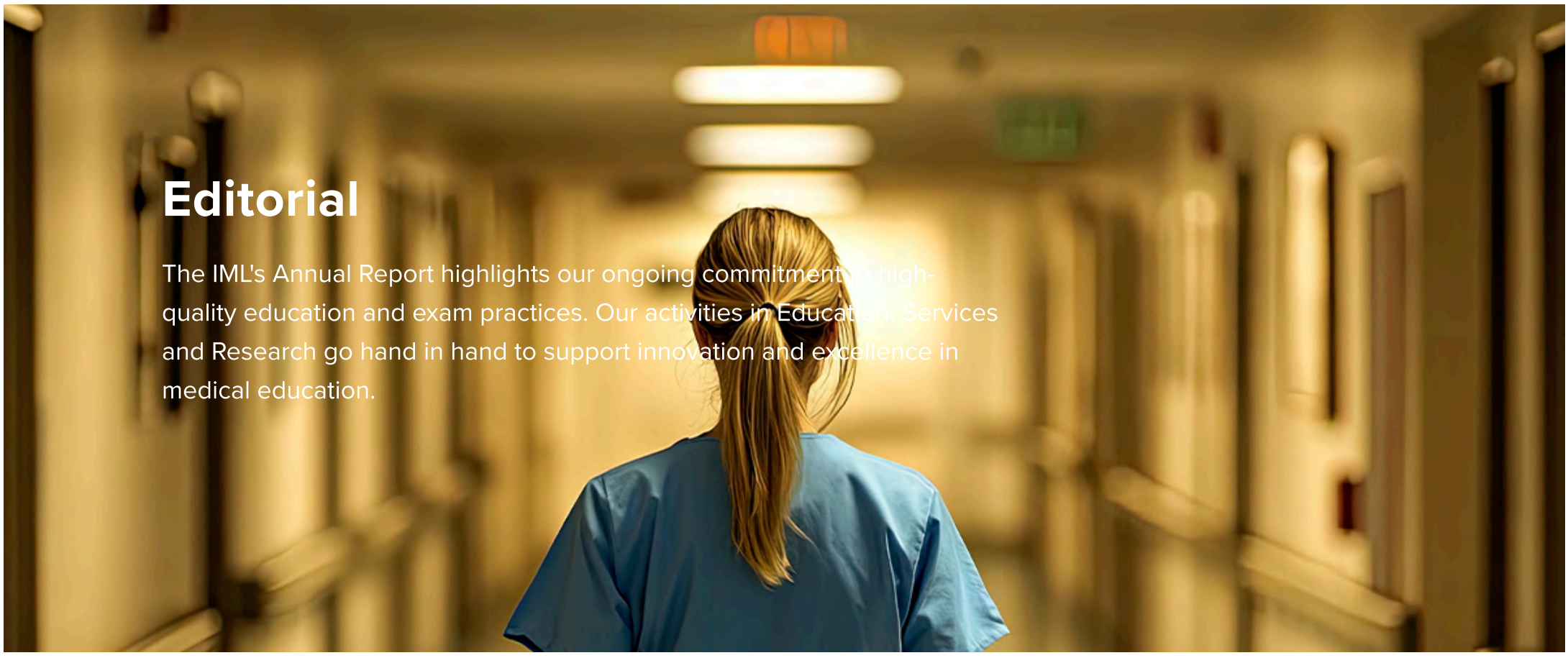

Editorial

The IML's Annual Report highlights our ongoing commitment to high-quality education and exam practices. Our activities in Education, Services and Research go hand in hand to support innovation and excellence in medical education.

Text: Prof. Dr. phil. Sissel Guttormsen Schär, 10.07.2025

At the Institute for Medical Education (IML) in 2024, we continued to pursue a wide range of activities in the field of medical education: teaching, facilitating learning with digital tools, supporting assessments, managing and developing assessment instruments, analysing exam results, managing postgraduate education programs and conducting research. Our efforts across education, services and research stimulate each other. Within the «full range of medical education» at the IML, our work is ongoing: when one project or exam concludes, another begins.

However, the context in which our activities take place is constantly evolving. We are continually learning—how to increase effectiveness without compromising quality, how to evolve as an institute and within teams of all sizes, and how to enhance our offerings while learning from own mistakes. In our 2023 Commemorative Publication, we reflected on 50 years of developments in medical education, spanning both technological and pedagogical advances. But 2024 brought a new contextual shift...

Since the release of ChatGPT in November 2022, we anticipated it might influence how we learn and manage information. By 2024, its impact has become evident: AI has significantly transformed how individuals at universities seek information, with students' digital literacy and adaptability playing a crucial role. In education, AI represents perhaps one of the most groundbreaking technical development in decades.

At the IML, we have embarked on an intense learning process to understand what this transformation means for us — and for our work and partners. We are exploring how to harness AI for the common good across all our activities. This journey raises important questions: How can we protect sensitive data while using large language models? How can we ensure that students and professionals continue to build their own knowledge base, even as AI becomes increasingly capable? These are ongoing challenges, and we anticipate they will remain central in the years ahead.

This annual report highlights IML’s unwavering commitment to high-quality education and fair, robust exam practices. It also presents the diverse activities of our departments: Assessment and Evaluation, Software Development, Education and Media, and the Master of Medical Education program. Through a collection of short «stories» and project updates, we aim to share both ongoing and new initiatives.

We hope you find the report insightful and engaging.

Sissel Guttormsen, July 2025

Prof. Dr. phil. Sissel Guttormsen Schär
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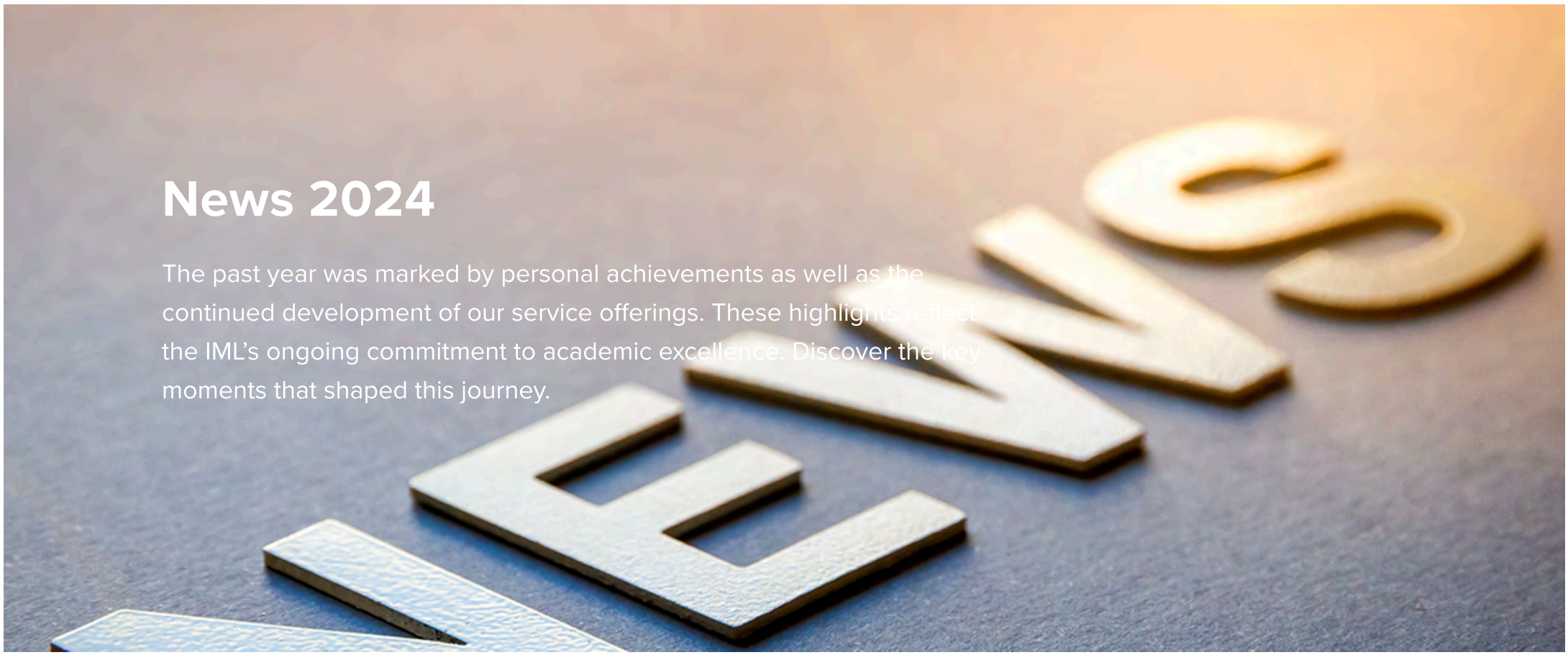


News 2024

The past year was marked by personal achievements as well as the continued development of our service offerings. These highlights reflect the IML's ongoing commitment to academic excellence. Discover the key moments that shaped this journey.

18.02.2025

Federal Examination in Veterinary Medicine

In 2024, the Federal Examination in Veterinary Medicine was conducted for the first time according to the new regulation with an interdisciplinary examination in the format of a written clinical knowledge exam with 240 multiple choice questions and a practical clinical skills exam with 12 stations in the format of an OSCE (Objective Structured Clinical Examination). The content of the examination was developed through a multi-stage, iterative peer review process with input from content and methodological experts. This approach ensured that all candidates were tested in a fair manner and provided excellent reliability.

Career steps at the IML

Prof. Dr. med. **Christoph Berendonk**, MME & PD Dr. med. **Kai Schnabel**, MME

Christoph Berendonk, Head of Group Practical assessment, Deputy Head of AAE was appointed 'Associate Professor' at the faculty meeting on 12th June 2024.

Kai Schnabel's habilitation was appointed at 20.03.2024, and the inaugural lecture on «The media-supported acquisition of practical skills - past and future» took place on 10th July as part of a special colloquium. He is currently the head of AUM Department.

Congratulations to both of them on this great success.

Presentation video for your habilitation

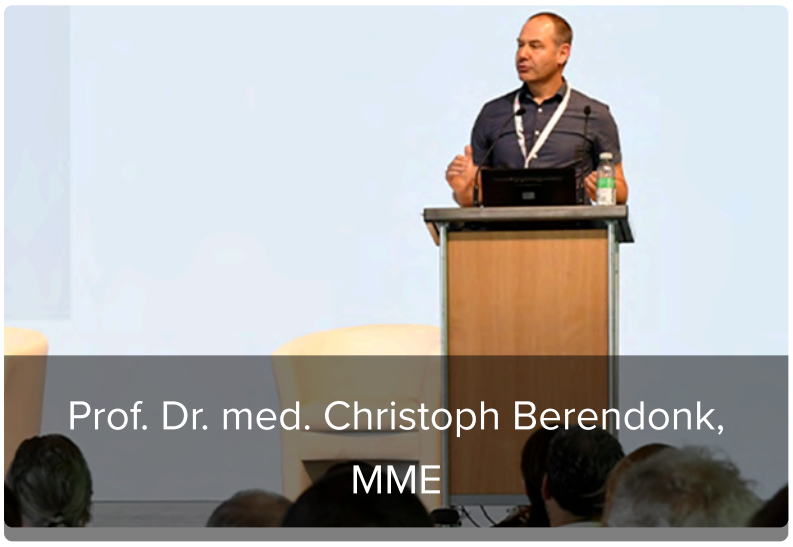
In Bern, all Habilitation applicants present themselves with a short video. Would you like to stand out with a personalised presentation video for your habilitation? We produce it for you. Our service includes individual advice and the creation of a customised solution in professional quality.

Read more

GHS with a fit for IMLs PhD Candidates

The ‘Graduate School for Health Sciences’ (GHS) is committed to quality in research and is supporting the Candidates on a PhD Track at the IML. In 2024 the IML had 5 PhD Candidates in the GHS program. As an interdisciplinary programme organised jointly by the Faculty of Medicine, the Faculty of Human Sciences and the Vetsuisse Bern Faculty, it offers a doctoral programme addressing health issues with an interdisciplinary perspective. GHS offers the PhD Candidates a quality framework for their work, and a community with the opportunity to exchange experience and seeking advice for their work among peers.
Prof. Dr. phil Sissel Guttormsen headed the funding committee of the GHS (2006 - 2008), leading to its funding in 2008. Now she chaired the GHS for further 4 years as President of the Steering Board Committee (2020 - 2024), handing over the presidency to Prof. Claudio Nigg (Phil. Hum) in 2025.

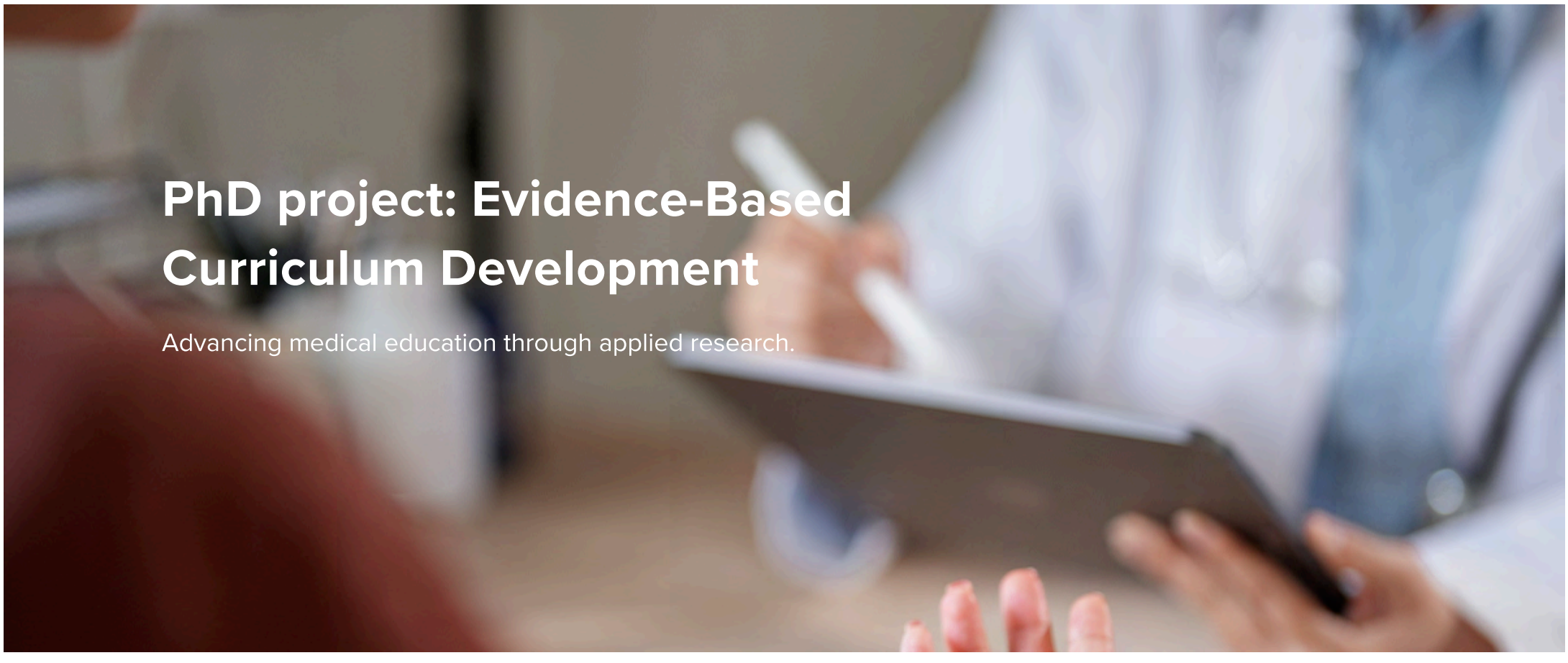
PD Dr. med. Kai Schnabel, MME



Prof. Dr. med. Christoph Berendonk, MME

Personalised presentation video for your habilitation


Prof. Dr. phil Sissel Guttormsen,
Director IML



PhD project: Evidence-Based Curriculum Development

Advancing medical education through applied research.

2024 2025 2026 Research

Medical education worldwide is shifting towards a competency-based approach. Medical curricula need to be revised to ensure that learners acquire the necessary skills, knowledge, and attitudes by the end of their studies. In Switzerland, competency-based learning outcomes are defined in the Profiles document. While these outcomes are standardized across Switzerland, individual medical schools have the flexibility to design their own curricula.

This PhD project explores different components of curriculum design: Developing a taxonomy of teaching methods, designing a coaching curriculum for large medical schools, evaluating the effectiveness of a longitudinal Clinical Reasoning curriculum, and medical students' preparedness for clinical work at the end of undergraduate education.

Aims

Overall research question: How can medical curricula be designed to effectively teach relevant competencies?

- **Study I:** Development of a taxonomy of teaching methods based on existing teaching methods reported in the literature, and gaining insight how they can be applied to health profession education.
- **Study II:** Development of a coaching program for medical students and investigating its feasibility for large medical schools.
- **Study III:** Investigating the learning outcomes of a newly introduced clinical reasoning curriculum, grounded in a case-based learning approach.
- **Study IV:** Investigating how well students feel prepared for clinical work towards the end of undergraduate education.

Ordering customer

Medical Faculty, University of Zürich

Financing

Medical Faculty, University of Zürich

Partner

Prof. Dr. med. Dominik Schaer, Vizedekan Lehre Klinik und Leitender Arzt, Klinik und Poliklinik für Innere Medizin, USZ, Universität Zürich

Team IML

Dr. Sharon Mitchell, Dr. Felix Schmitz, Prof. Dr. Dr. Sören Huwendiek, Dr. Daniel Stricker

PhD Thesis Commission, Graduate School for Health Sciences

PhD candidate: Lucia Weber (Master of Science in Psychologie), IML University of Bern and Medical faculty, University of Zurich
Thesis Advisor: Prof. Dr. phil. Sissel Guttormsen, IML University of Bern
Co-Thesis Advisor: Prof. Dr. med. Dominik Schär, USZ, University of Zurich
Co-Referee: Prof. Dr. Anders Sondén, Senior Lecturer, Department of Clinical Science and Education, Södersjukhuset, Karolinska Institutet Stockholm

External project partners:
Dr. med. Christian Schirlo, Leiter Studiendekanat, Fakultät für Gesundheitswissenschaften und Medizin, Universität Luzern

Dr. med. Dr. sc. Stefan Gysin, Studiengangsleiter Joint Medical Master, Fakultät für Gesundheits-wissenschaften und Medizin, Universität Luzern

Dr. med. Jonas Florin, Leiter klinische und praktische Ausbildung Joint Medical Master, Fakultät für Gesundheitswissenschaften und Medizin, Universität Luzern

Project information

Running time: 2024 - 2028

Contact email

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PhD project (SNF): Digital Learning and Teaching (DLT)

Implementing effective digital learning and teaching in higher education beyond the Covid-19 pandemic. Aligning key players' needs, bringing distant communication close and supporting students' individual learning.

2021 2022 2023 2024 2025 Research

The pandemic has shown the importance of well-designed Digital Learning and Teaching (DLT). Many of the current applications and implementations have weaknesses. The role of the teaching organisations, as well as the needs of lecturers and students are not well understood nor well met. In this project we aim at understanding keyplayers needs and implementing specific solutions, while invesitgating their effectivity. In order to keep up the current disruptive DLT development, DLT needs a conceptual framework.

Aims

We address the following overall research question: How can medical schools effectively support lecturers and students with DLT?
Study I: We aim at exploring how requirements and needs are aligned between the key players in Swiss medical schools, to set the stage for future developments.
Study II: We investigate the impact of students' simulated patient encounters with video vs. face-to-face on perceived 'social presence', acceptance and performance.
Study III: Various means to support individual learning for students in a DLT context will be investigated.

Financing

SNF project 100019_200811

PhD Thesis Commission, Graduate School for Health Sciences

PhD candidate: Dr. med. Artemisa Gogollari
Thesis Advisor: Prof. Dr. phil. Sissel Guttormsen
Co-Referee: Prof. Stefan Schauber, University of Oslo (Norway)

SNF project partner

IML partners:
Prof. Dr. phil. Sissel Guttormsen (Main applicant)
Dr. med. Kai Schnabel, MME (Co-Project applicant)
Prof. Dr. Dr. med. Sören Huwendiek, MME (Project partner)
Dr. phil. Felix Schmitz (Scientific collaborator)

External project partners:

Dr. med. Christian Schirlo, Leiter Studiendekanat, Fakultät für Gesundheitswissenschaften und Medizin, Universität Luzern

Dr. med. Dr. sc. Stefan Gysin, Studiengangsleiter Joint Medical Master, Fakultät für Gesundheits-wissenschaften und Medizin, Universität Luzern

Dr. rer. biol. hum. Daniel Tolks (Universität Bielefeld, D; LMU München)

Project Information

Project period: 2021 - 2025

Dr. med. Artemisa Gogollari
PhD student

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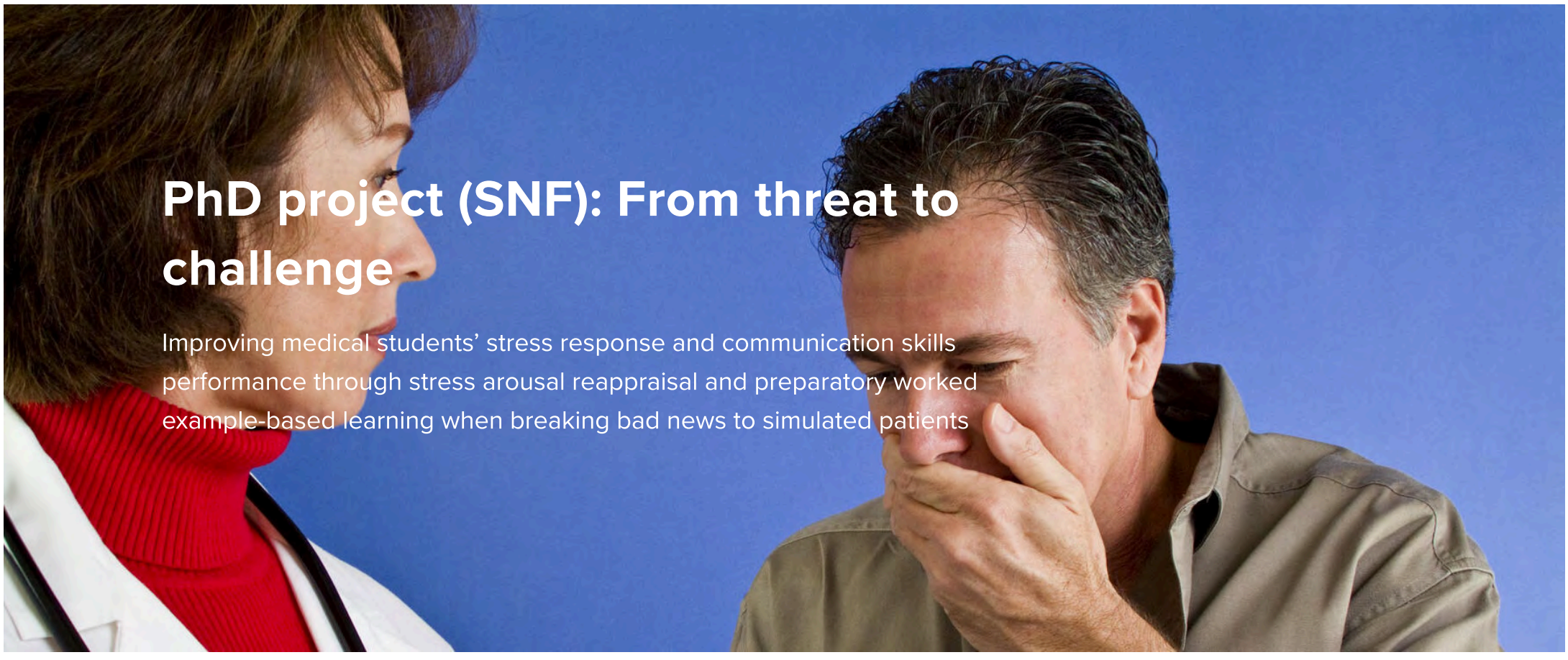

PhD project (SNF): From threat to challenge

Improving medical students' stress response and communication skills performance through stress arousal reappraisal and preparatory worked example-based learning when breaking bad news to simulated patients

2021 2022 2023 2024 2025 Research

Braking bad news (BBN) to patients is a frequent and stress-evoking task for many physicians. Medical students do already practice this demanding task in communication trainings with simulation patients. The intensity of their stress reaction is comparable to that in the real situation and can lead to a decrease of their BBN skills performance.Therefore, it is important to provide strategies that help medical students to effectively deal with this highly stressful communication task.

Aims

The aim of this project is to explore the effects of the strategies «stress arousal reappraisal» and «preparatory learning with worked examples» on medical students' stress response and BBN skills perfromance. For this purpose, 200 medical students from Swiss universities will be tasked with BBN to simulation patients. BBN skills performance, cardiovascular activity, stress hormone release and the subjective stress perception of the students will be recorded.

Financing

SNF project 100019_200831

PhD Thesis Commission, Graduate School for Health Sciences

PhD candidate: Michel Bosshard (Master of Science in Psychologie)

Thesis Advisor: PD Dr. med. Christoph Berendonk, MME

Co-Referee: Prof. Dr. Achim Alfering, Institut für Psychologie, Bern

SNF project partner

IML:

PD Dr. med. Christoph Berendonk, MME (Main applicant)

Dr. phil. Felix Schmitz

Prof. Dr. phil. Sissel Guttormsen

External project partners:

PD Dr. Patrick Gomez, University Lausanne, Faculty of Biology and Medicine, Switzerland

Univ.-Prof. Dr. Urs Markus Nater, Universität Vienna, Austria

Project Information

Project period: 2021 - 2025

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PhD student

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Prof. Dr. med. et MME Christoph Berendonk
Head of Group Practical assessment, Deputy Head of AAE

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PhD project: Post-graduate medical education programs

What makes post-graduate medical education programs (CME) at the University-level attractive?

2021 2022 2023 2024 2025 2026 Research

The number of participants of post-graduate medical programs increases significantly in later years. There are manyfold challenges in this context, which need to be addressed in order to provide best-practice and up-to-date CME programs in the future: (1.) digitalization, (2.) globalization of knowledge, (3.) relevance for the society and professional development, and (4.) privіding high quality, innovative teaching and learning opportunities.

Providers of CME programs must face these challenges to survive in the global competition and to attract candidates to join these programs. One way of addressing those challenges is to focus on the post-graduate program participants' needs and interests, as in the field of marketing with the strategy and concept of 'customer centricity'. This concept which normally embraces a company's strategy, structures and processes, and generates knowledge about its customers and the company's` culture, - is recently also used as a method for modelling continued educational offers at a university level.

Aims

This PhD project will help us to develop a differentiated understanding of attractiveness of CME programs, including usefulness, accountability, practicality, return on investment, acceptability, etc.. Research on the structure, content and orientation of such programs is rare. This project sets out to fill this gap. The application of a new and efficient approach, gives structure to the research and supports a change of perspective, which is promising.

PhD Thesis Commission, Graduate School for Health Sciences

PhD candidate: Melanie de la Rosa (M. A. Pädagogik)
Thesis Advisor: Prof. Dr. phil. Sissel Guttormsen
Co-Referee: Prof. Ara Tekian, PhD, MHPE, University of Illinois, Chicago (USA)

IML project partner:
Dr. phil. Felix Schmitz

Project information

Running time: 2021 - 2026

Melanie de la Rosa
PhD student

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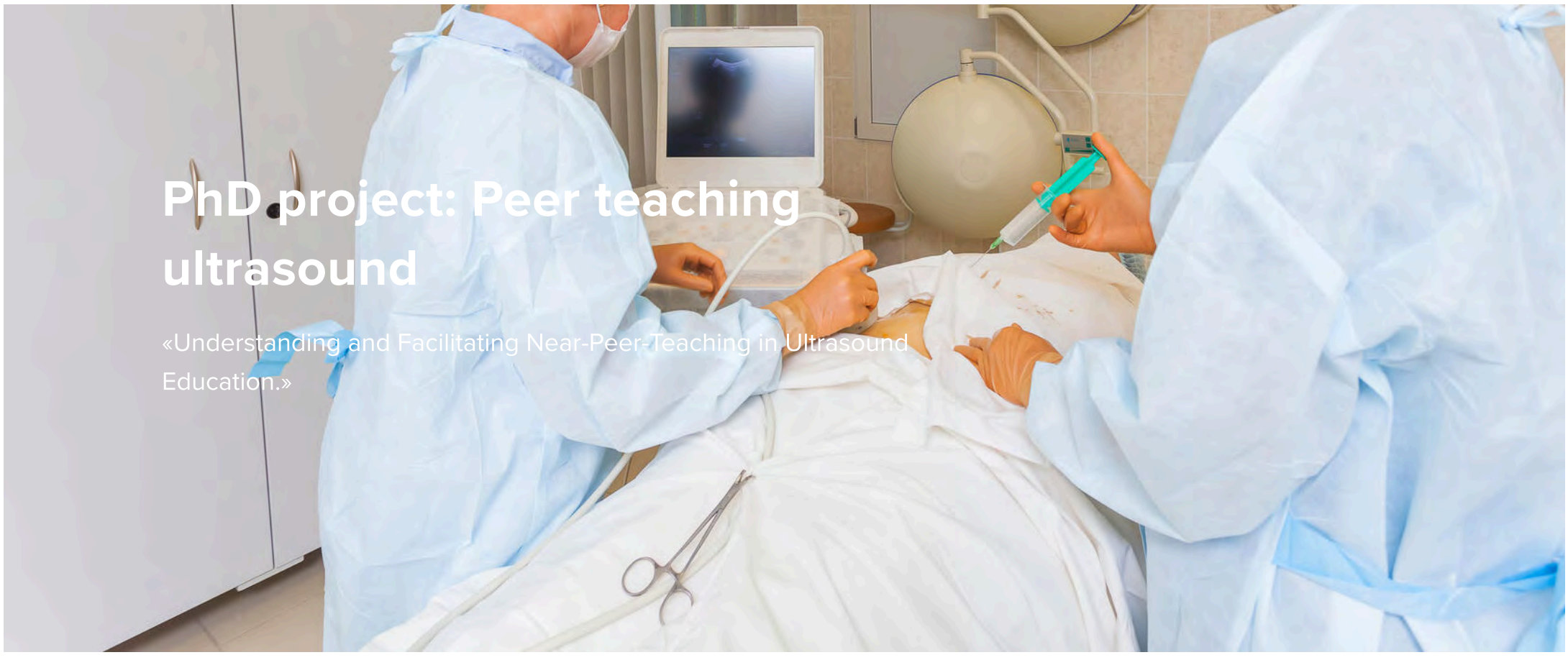

PhD project: Peer teaching ultrasound

«Understanding and Facilitating Near-Peer-Teaching in Ultrasound Education.»

2020 2021 2022 2023 2024 Research

Young doctors nowadays need to perform simple ultrasound investigations early on in their clinical career and ultrasound education is thus shifting to undergraduate medical education. Performing ultrasound scans is a complex skill with procedural and pattern recognition aspects best taught in small groups with just-in time feedback and verbalisation of cognitive processes. Near-peer teaching is increasingly used by medical schools to alleviate ultrasound teaching responsibility for faculty. Near-peer teaching is defined as an educational strategy in which one student teaches one or more fellow students whereas the teaching student is more advanced in the same curriculum. Little is known about near-peer teaching in the context of ultrasound education.

Aims

The overarching aim of this PhD is to investigate how near-peers support fellow students in learning practical ultrasound skills.

Team

PhD student: PD Dr. med. Roman Hari, MME (BIHAM)
PhD Co-supervisor: Prof. Dr. Dr. med. Sören Huwendiek, MME (IML)
Supervisor: Prof. Dr. phil. Diana Dolmans (Maastricht)
Daily supervisor: Ass. Prof. Dr. phil. Rene Stalmijer (Maastricht)

Partners

BIHAM, School of Health Profession Education Maastricht

Project information

Running time: 2020 – 2024

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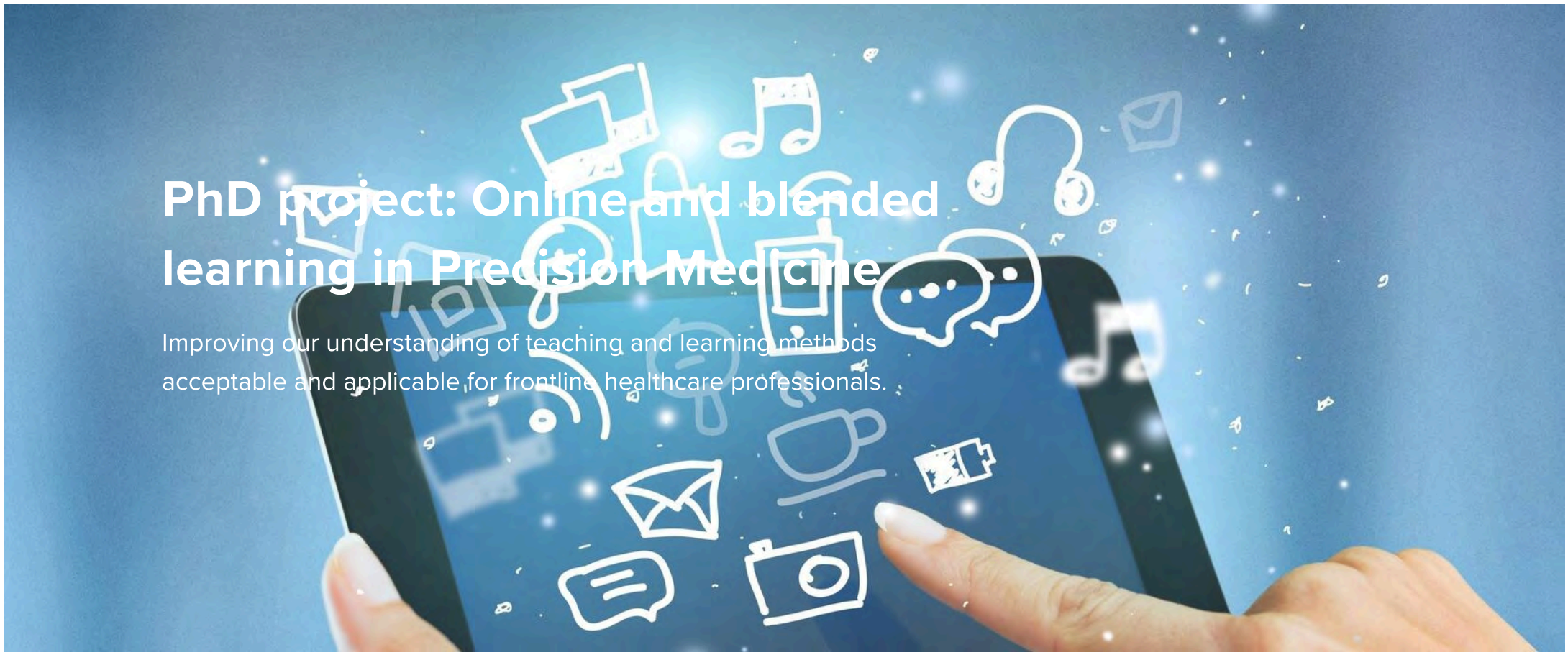

PhD project: Online and blended learning in Precision Medicine

Improving our understanding of teaching and learning methods acceptable and applicable for frontline healthcare professionals.

2020 2021 2022 2023 2024 Research

Healthcare professionals are required to complete CPD (continuing professional development) but this too often becomes a tick box exercise. Education offerings for active healthcare professionals must be practical to individual needs and offer different teaching methods, whereby learning becomes a fluent, adaptable and continually moving entity tied to the needs of each individual health professional. This project will apply empirical methods to develop a best practice approach for education needs assessment to design, plan and implement a blended learning training programme to deliver a new topic, Precision Medicine, to frontline healthcare professionals.

Aims

PhD Thesis: Implementing evidence based education to design and implement online and blended learning in Precision Medicine in the context of continuing professional development (CPD)

The results of this research will inform the design, planning and implementation of a national online and blended training programme in Precision Medicine across Switzerland.

Financing

This research is part of the FRONTLINERS project in Precision Medicine funded by Health2030 described here.

Project Team

PhD Candidate: Ms. Sharon Mitchell M.Sc, IML, University of Bern

PhD supervisor: Prof. Dr. phil. Sissel Guttormsen, IML, medical faculty, University of Bern

PhD-Co-Supervisor: Prof. Dr. med. Idris Guessous, Division and Department of Primary Care Medicine, Geneva University Hospitals and Faculty of Medicine, Geneva

Co Referee: Professor Janusz Janczukowicz MD, PhD, MMedEd, Medical University of Lodz, Polan

Team IML

Dr. phil. Felix Schmitz, Head of Research group in ASCII, IML, medical faculty, University of Bern

Daniela Schmid, UX expert at ASCII, IML, medical faculty, University of Bern

Overall Project PI

Prof. Dr. med. Idris Guessous, Division and Department of Primary Care Medicine, Geneva University Hospitals and Faculty of Medicine, Geneva (PI)

Prof. Dr. Dr. med. Gérard Weber, Department of Medicine, University Hospital CHUV, Lausanne (Co-PI)

Prof. Dr. med. Jaques Cornuz, Unisanté, Faculty of biology and medicine, University of Lausanne, Rue du Bugnon 44, 1011 Lausanne (Co-PI)

Prof. Dr. phil. Sissel Guttormsen, IML, medical faculty, University of Bern (Co-PI)

Project information

Running time: 2020 - 2024

Dr. phil. Sharon Mitchell
Scientific collaborator

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Precision Medicine for FRONTLINERS

Is a multi-support learning platform on Precision Medicine for the daily practice of frontline care professionals.

2019 2020 2021 2022 2023 2024 2025 Research Education

Nowadays, the majority of primary care professionals are not prepared to deal with issues related to precision medicine.

Frontliners is a training program that offers basic and advanced training opportunities to primary care professionals (PCPs) including physicians, pharmacists and nurses to support them in delivering high-value information, advice and care in precision medicine (PM) to their patients.

Five online modules have been included in the launch of Frontliners: an introduction to precision medicine, shared decision-making, genomic testing, pharmacogenetics and precision medicine in primary care.

Objective

- Offer an online platform with practical ready to use content
- Provide onsite learning and networking opportunities
- Present quality resources and information on PM
- Bringing together the best experts as teachers and mentors

Project team

Prof. Dr. med. Idris Guessos, Geneva University Hospitals, UNIGE (Co-IP)
Prof. Dr. phil. Sissel Guttormsen, IML, medical faculty, University of Bern (Co-IP)
Prof. Dr. med. Jacques Cornuz, Unisanté/UNIL (Co-Applicant)
Prof. Dr. Dr. med. Gérard Waeber, CHUV/UNIL (Co-Applicant)

Financing

health2030

Team IML, focus medical Education

Sharon Mitchell (PhD Candidate), Felix Schmitz (Scientific collaborator), Daniela Schmid (Web Design), Sissel Guttormsen (Co-Project head, PhD Supervisor)

Extended Team, focus on content experts and implementation

A wider team of experts including the content experts, authors and reviewers have consistently supported development of Frontliners since 2020.

Ms. Samila Tankhimovitch University of Geneva (UNIGE)	Coordination and administrative support	Member of the project team, 2022 - 2024
Dr. James Nef, Hopital du Valais, Sion	Active member for 6 months. Content review of modules. Support educationalist to review content and development of content on website.	Scientific collaborator 2023 - 2024
Dr. Sarah Richtering, Hopitaux Universitaires de Genève (HUG)	Active member for 6 months. Content review of modules. Support educationalist to review content and development of content on website.	Scientific collaborator 2023
Dr. Daniel Widmer, Clinique de la Source, Lausanne	Lead content expert on module precision medicine in primary care.	Content expert 2022 - 2024
Prof. Chantal Csajka Research Centre, CHUV	Lead content expert on module Pharmacogenetics	Content expert 2023 - 2024
Aude Coumau Research Centre, CHUV	Author and content expert on module Pharmacogenetics	Content expert 2023 - 2024
Mr. Michael Balavoine, Médecine et Hygiène journal, Planète Santé	Lead branding development Develop Frontliners website	Communications Advisor, 2022
Dr. Evrim Jaccard, Internal medicine unit, Hirslanden, Lausanne	Co-lead on research projects. Liasion with content experts. Project management of module development.	Member of the project team 2020 - 2022
Dr. Marie-Anne Durand, Unisanté, Lausanne	Lead content expert on module shared decision making.	Content expert 2021 - 2022
Dr. Kevin Selby, University of Lausanne (UNIL)	Lead content expert on module shared decision making & Introduction to Precision Medicine module.	Content expert 2021 - 2022
Roxane van Heurck, Hopitaux Universitaires de Genève (HUG)	Lead content expert on module genomic testing.	Content expert 2021 - 2022
Prof. Marc Abramowicz, Hopitaux Universitaires de Genève (HUG)	Lead content expert on module genomic testing.	Content expert 2021 - 2022
Dr. Daniel Roman, CHUV, University of Lausanne (UNIL)	Lead content expert on module Introduction to Precision Medicine	Content expert 2020 - 2021
Dr. Jacques Fellay, CHUV, University of Lausanne (UNIL)	Lead content expert on module Introduction to Precision Medicine	Content expert 2020 -2021
Ms. Prune Collombet University of Geneva (UNIGE)	Coordination and administrative support	Member of the project team, 2019 – 2021

Project information

Running time: since 2019

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Dr. phil. Sharon Mitchell
Scientific collaborator

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Self-Directed Learning (SDL) in the Healthcare Professions

How can students and experts be supported in maintaining their personel knoweldge?

2018 2019 2020 2021 2022 2023 2024 2025 Education

To guarantee high-quality services, healthcare professionals are required to successfully maintain their extensive knowledge base. Health professionals are expected to consistently stay up-to-date in their field, in which new knowledge is evolving continuously. Students are in a constant process of learning, which also involve searching and processes various information sources by their own initiative. On this background there is a need to understanding the SDL processes in order to effective support learners on all stages during their lifelong, self-directed, learning. We are investigated related topics in various running research projects.

Objective

We investigate the SDL processes from different perspectives:

- elements of the SDL learning process, and the resulting needs and expereinces of healthcare professionals in their daily lifes,
- elaborating technical tools supporting the learning process and needed features and functionalities,
- the view of work and organisational psychology (models and effects on individuals and systems).

Partner

Prof. Dr. med. Andreas Raabe, University clinic for neurosurgery, Insel-Hospital Bern

Prof. Dr. phil. Achim Elfering, Institute of Psychology, Department of Work and Organisational Psychology, University of Bern

Dr. phil. Jodie Freeman, Institute für Sozial und Präventivmedizin, University of Bern (2022–2023)

Linda Christa, Schulpsychologin Ebikon (Masterarbeit 2020-2021)

Noa Lindner, Bildungsprojektleiterin SBB (Masterarbeit 2021-2022)

Team IML

Prof. Dr. phil. Sissel Guttormsen

Dr. med Joana Berger-Estilita

Dr. phil. Felix Schmitz

Dr. med. Benny Wohlfahrt

Publications

Joana Berger-Estilita, Linda Krista, Artemisa Gogollari, Felix Schmitz, Achim Elfering, Sissel Guttormsen (2025), Self-directed learning in health professions: A mixed-methods systematic review of the literature, in PLOS one, May 2, 2025. https://doi.org/10.1371/journal.pone.0320530

Freeman, J., Raabe, A., Schmitz, F., Guttormsen, S. (2024). How neurosurgeons maintain and update their professional knowledge in a self-directed learning context. *BMC Med Educ* 24, 763 (2024). https://doi.org/10.1186/s12909-024-05692-9

Wohlfahrt B., Linder N., Schmitz F.M., Hari R., Elfering, A., Guttormsen, S. (2024). Self-directed learning among general practitioners in the German-speaking part of Switzerland: a qualitative study using semi-structured interviews: Did habits change under recent technological shifts? *Swiss Medical Weekly,* 154, 7, 154:3436. https://smw.ch/index.php/smw/article/view/3436

Freeman, Jodie; Raabe, Andreas; Schmitz, Felix; Guttormsen, Sissel (2019). Lifelong self-directed learning in the digital age: an orientation of current software tools supporting experts in maintaining and updating their knowledge. In: *Sampson, Demetrios G.*; Ifenthaler, Dirk; Isaías, Pedro; Mascia, Maria Lidia (eds.) CELDA 2019. 16th International Conference on Cognition and Exploratory Learning in Digital Age. Proceedings (pp. 443-446). Cagliari, Italy: IADIS Press, ISBN 978-989-8533-93-7

Completed Mastertheses addressing SDL

Master-Thesis psychology: Noa Miranda Linder (2022).
Selbstgesteuertes Lernen bei Hausärzt:innen in der COVID-19 Pandemie
Thesis Advisor: Prof. Sissel Guttormsen, Dr. Felix Schmitz, IML, Universität Bern
Submitted to: Prof. Achim Elfering, Institut für Psychologie, Abteilung für Arbeits- und Organisationspsychologie, Universität Bern

Master-Thesis psychology: Linda Krista (2021).
Self-Directed Learning in Health Professions: a Systematic PRISMA Review
Thesis Advisor: Prof. Sissel Guttormsen, Dr. Felix Schmitz, IML, Universität Bern
Submitted to: Prof. Achim Elfering, Institut für Psychologie, Abteilung für Arbeits- und Organisationspsychologie, Universität Bern

Project information

Running time: since 2018

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Gender gap phenomenon

Gender differences in the career motivations of health professionals.

2020 2021 2022 2023 2024 Research

Despite numerous attempts to promote equality between women and men, there are still significantly more men in top positions in Switzerland. This gender gap phenomenon is not only found in companies, but is also visible in socially-oriented professions such as medicine and psychology.

Aims

This project seeks to investigate whether there is a gender difference in career motivation among students of medicine and psychology. It will also examine whether career motivations change in a gender-specific manner over the course of the degree, and which of the influencing factors that are already known are most influential.

Partners

Prof. Dr. phil. Achim Elfering, Institute of Psychology, Department of Work and Organisational Psychology, University of Bern
Ellen Surdel, Psychologin

Team IML

Prof. Dr. phil. Sissel Guttormsen,
Dr. phil. Felix Schmitz

Publications

Wohlfarth, B., Surde, E., Schmitz, F., Elfering, A., Guttormsen, S. (In print). **A Trend Analysis of Career Motivation: Gender-Specific Differences among Students of Human Medicine and Psychology in Switzerland and Germany.** BMC Medical Education.

Masterarbeit

Ellen Surdel (2022).
Karrieremotivation: Geschlechterspezifische Unterschiede von Medizin- und Psychologiestudierenden
Hauptbetreuer:innen: Prof. Sissel Guttormsen, Dr. Felix Schmitz, (IML), Co-Betreuer: Prof. Achim Elfering (Institut für Psychologie, Universität Bern).

Project information

Running time: since 2020

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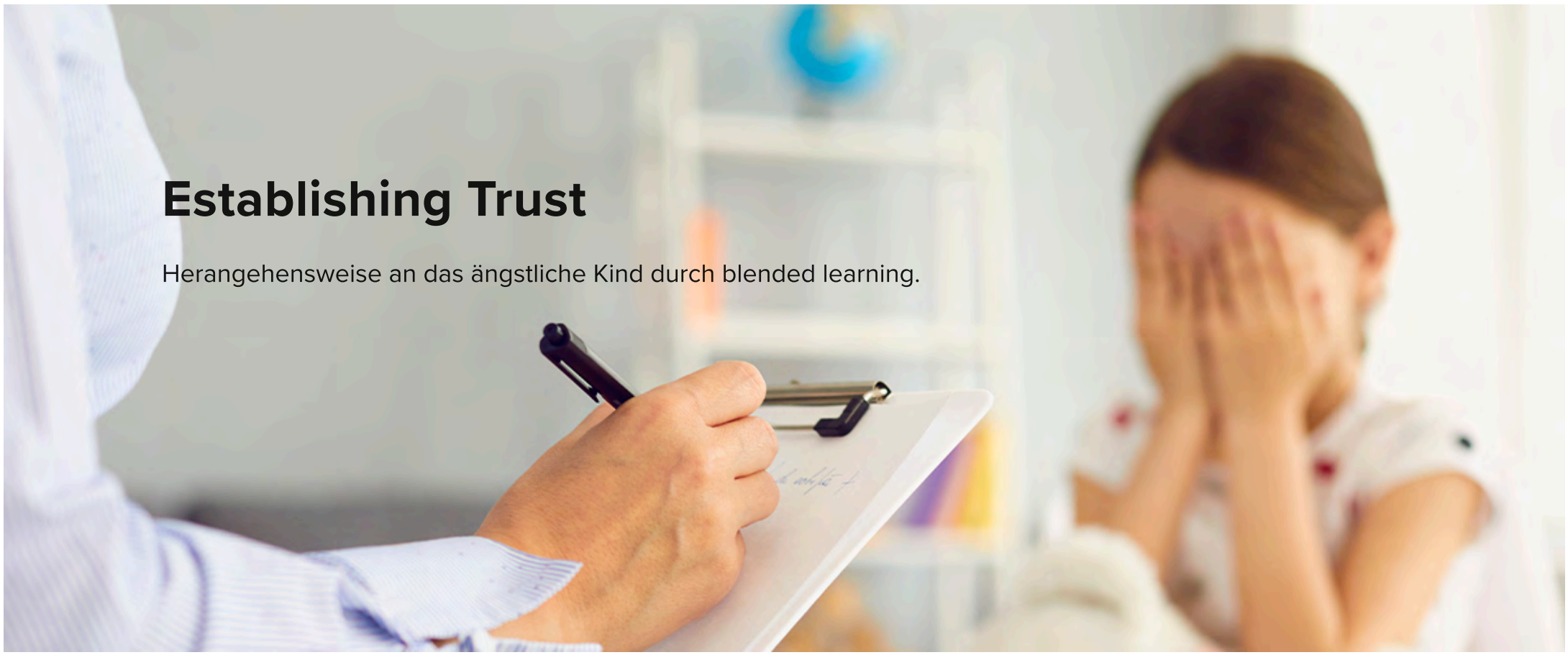

Establishing Trust

Herangehensweise an das ängstliche Kind durch blended learning.

2023 2024 Research Education

Der Umgang mit ängstlichen Kindern stellt im klinischen pädiatrischen Alltag eine große Herausforderung dar. Je nach Alter können Kinder die Notwendigkeit von medizinischen Untersuchungen und Behandlungen nicht nachvollziehen und dementsprechend den dadurch entstandenen Stress nicht rational überwinden. Der Aufbau einer vertrauensvollen Beziehung und der gezielte Einsatz von Kommunikationsstrategien mit Kindern ist von grundlegender Bedeutung zur Schaffung einer stress- und angstfreien Umgebung und zur Erzielung einer kindgerechten und effizienten pädiatrischen Versorgung.

Ziele

Durch ein strukturiertes blended learning mit Einsatz von Virtual Reality, interaktiven Workshops und direkter Supervision bei Patient:innen sollen Assistenzärzt:innen auf den Umgang mit ängstlichen Kindern im klinischen Alltag optimal vorbereitet werden.

Auftraggebende

Stiftung Kinderinsel Bern

Partner:innen

Dr. med. Fabrizio Romani Oberarzt Kinderspital (Projektleiter)
Dr. med. Isabelle Steiner, Chefärztin, Co-Leiterin Notfallzentrum für Kinder und Jugendliche

Finanzierung

Stiftung Kinderinsel Bern

Team

IML: Prof. Dr. Dr. med. Sören Huwendiek (Abteilungsleiter AAE)

Projektinformation

Laufzeit: 2023 – 2024

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Head of AAE Department

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us in der Medizin – iven für die medizinische ng

Beitrag der GMA zur Sensibilisierung von Studierenden, Lehrenden und weiteren in der medizinischen Lehre tätigen Personen zum Thema rassistische Diskriminierung im Gesundheitswesen.

2021 2022 2023 2024 Research

Die Genfer Deklaration des Weltärztebundes fordert von ärztlichen Fachpersonen sich «bei der Erfüllung ihrer ärztlichen Pflichten ihren Patient:innen gegenüber nicht durch Alter, Krankheit oder Behinderung, Glaube, ethnische Herkunft, Geschlecht, Staatsangehörigkeit, politische Zugehörigkeit [...], sexuelle Orientierung, soziale Stellung oder durch andere Faktoren» beeinflussen zu lassen. In der Realität berichten jedoch Patient:innen, Lehrende und Medizinstudierende im deutschsprachigen Raum von Diskriminierungserfahrungen. So zeigen z.B. Studien aus Deutschland, dass rund die Hälfte der Akteur*innen Diskriminierung im Gesundheitswesen beobachtet oder selbst erfahren hat. Mit dem Mandat des Vorstandes der Gesellschaft für Medizinische Ausbildung (GMA) wird vor diesem Hintergrund ein Positionspapier zum Thema Rassismus in der Medizinischen Ausbildung erarbeitet.

Ziele

Mit diesem Positionspapier möchten die Ausschüsse «Kulturelle Kompetenz und Global Health» und «Gender, Diversity und Karriereentwicklung in der medizinischen Aus- und Weiterbildung» der GMA einen Beitrag leisten zur Sensibilisierung von Studierenden, Lehrenden und weiteren in der medizinischen Lehre tätigen Personen zum Thema rassistische Diskriminierung im Gesundheitswesen. Dabei soll unter anderem auf die Bedeutung von Lehrangeboten zur Vermittlung von Rassismus kritischen Kompetenzen in der medizinischen Ausbildung hingewiesen und deren Entwicklung mit ausgearbeiteten Empfehlungen unterstützt werden. Um eine vertiefte Auseinandersetzung mit Rassismus auf diversen Wirkebenen anzuregen und deren Fortbestand in der Ausbildung zu miniminieren, werden theoretische Hintergründe beschrieben, Definitionen hergeleitet und eine Erhebung der aktuellen Integration von Lehrangeboten im Studium der Humanmedizin in den deutschsprachigen Ländern durchgeführt und Empfehlungen zur Entwicklung von Lehrangeboten als auch zur Qualifikation der Lehrpersonen dargestellt.

Auftraggebende

Gesellschaft für Medizinische Ausbildung (GMA)

Partner:innen

GMA Ausschüsse «Kulturelle Kompetenz und Global Health» und «Gender, Diversity und Karriereentwicklung in der medizinischen Aus- und Weiterbildung»

Team IML

Daniel Bauer, Felix Schmitz

Projektinformation

Laufzeit: 2021-2024

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Dr. phil. Felix Michael Schmitz
Head of Group "Research"

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Viva VOsCE

Virtual Objective structered Clinical Examinations

2023 2024 2025 Assessment

Viva VOsCE will deliver a Virtual Reality platform to assist medical schools in delivering and assessing OSCEs.

Aims

With Viva VOsCE, we aim to create a Virtual Reality (VR) based OSCE platform. The purpose of this platform will be to assist medical schools in the assessment of students, and to do so with a significant reduction in logistical effort and overall cost.

Ordering customer

Innosuisse

Financing

Innosuisse

Project team

Main applicant: Oliver Kannape, PhD (The Virtual Medicine Center - Hôpitaux Universitaires de Genève). Research project partners: Thomas Sauter MD MME, Emergeny Telehealth University of Bern; Christoph Berendonk MD MME, Institute for Medical Education University of Bern; Implementation project partner: George Papagiannakis, ORamaVR SA

Team IML

Christoph Berendonk, Florian Neubauer

Project information

Running time: 6/2023 - 5/2025

Prof. Dr. med. et MME Christoph Berendonk
Head of Group Practical assessment, Deputy Head of AAE

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DocCom.Deutsch: Webbasierte Lernmodule zur patientenzentrierten Kommunikation

DocCom.Deutsch ist eine Serie medienunterstützter Online Module für die Aus-, Weiter- und Fortbildung in der Kommunikation im Gesundheitswesen. Daran beteiligt sind Ärztinnen und Ärzte sowie Fachpersonen aus der Schweiz, Deutschland und Österreich.

2016 2017 2018 2019 2020 2021 2022 2023 2024 Service Research Education Usability

Zielsetzung

Die Module vermitteln Theorie und praktische Beispiele, die als Vorbereitung für das praktische Kommunikationstraining konzipiert sind.

Zielgruppe

Aus- und Weiterbildende in den Gesundheitsberufen

Team IML

Sissel Guttormsen, Kai Schnabel, Daniel Bauer, Adrian Michel, Axel Hahn

Partner, welche die Lernplattform bereits benutzen

Publikationen

Schmitz FM, Schnabel KP, Bauer D, Woermann U, Guttormsen S. Learning how to break bad news from worked examples: Does the presentation format matter when hints are embedded? Results from randomised and blinded field trials, Patient Educ Couns. 2020. https://doi.org/10.1016/j.pec.2020.03.022

Schmitz FM, Schnabel K, Bauer D, Bachmann C, Woermann U, Guttormsen S. The learning effects of different presentations of worked examples on medical students' breaking-bad-news skills: A randomized and blinded field trial, Patient Educ Couns. 2018; 101(8):1439-1451. https://doi.org/10.1016/j.pec.2018.02.013

Guttormsen S, Langewitz W, Schnabel K. „DocCom.Deutsch" Ein videobasiertes Instrument zum Kommunikationstraining in Gesundheitsberufen. Jahrestagung der internationalen Gesellschaft für Gesundheit und Spiritualität: Spiritual Care im Kontext Chronischer Erkrankungen und Schmerzen. Zürich, 27.-28.10.2017.

Schmitz FM, Schnabel K, Stricker D, Fischer MR, Guttormsen S. Learning communication from erroneous video-based examples: A double blind randomised controlled trial. Patient Educ Couns. 2017; 100(6):1203-1212-http://dx.doi.org/10.1016/j.pec.2017.01.016

Lanken PN, Novack DH, Daetwyler C, Gallop R, Landis JR, Lapin J, Subramaniam GA, Schindler GA. Efficacy of a Media-Rich, Internet-Based Learning Module Plus Small Group Debriefing on Medical Trainees' Attitudes and Communication Skills with Patients with Substance Use Disorders: Results of a Two-Center, Cluster Randomized Controlled Trial. Acad Med. 2015; 90(3): 345-354. https://doi.org/10.1097/ACM.0000000000000506

Daetwyler CJ, Cohen DG, Gracely E, Novack DH. eLearning to enhance physician patient communication: A pilot test of "doc.com" and "WebEncounter" in teaching bad news delivery. Med Teach. 2010; 32: e381-e390. https://doi.org/10.3109/0142159X.2010.495759

Projektinformation

Laufzeit:

Phase I: 2011 – 2014

Seit 2014: kontinuierliche(r) Unterhalt und Weiterentwicklung

Finanzierung:

Phase I/Spende durch Novartis Stiftung für Mensch und Umwelt

Link

Website DocCom.Deutsch

MedSurf

Numerous online learning programs like MorphoMed, RadioSurf or CliniSurf, which were developed at the Department for Education and Media AUM at the IML in conjunction with specialist representatives from the Faculty of Medicine, need to be updated.

2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 Education

To ensure the continued use and long-term success of these highly popular learning programs, a transition is essential - both from a technological and a creative perspective.

Objective

Our online learning programs must meet the latest technical standards and function seamlessly across the full range of modern devices. New features - such as an advanced search function and deep linking - significantly enhance the user experience.
In addition, the development of an authoring system for learning content supports the creation of complex, didactically structured learning scenarios.

The following learning modules have been developed using MedSurf:

- MorphoMed – for anatomy, histology, and pathology
- RadioSurf – for radiology of the chest, skeleton, and head
- ChiroSurf – for surgery
- DentoSurf – for dental medicine
- PediRad – for pediatric radiology
- CliniSurf – for pediatric auscultation. For clinical examination techniques

Additional learning modules are currently in development.

A complete list of all our online learning programs is available [here].

Commissioned by

Faculty of Medicine, University of Bern

Team

Institute of Anatomy, University of Bern
Prof. Dr. phil. nat. Benoît Zuber

Institute of Tissue Medicine and Pathology

PD Dr. med. et phil. nat. Yara Banz

Department of Diagnostic, Interventional, and Pediatric Radiology (DIPR), Inselspital, University Hospital Bern

Prof. Dr. Dr. med. Johannes Heverhagen

And many more contributors

Institute for Medical Education (IML), University of Bern

Dr. med. Nick Lüthi, MME

Florian Goll

Andrea Gottsponer

Thomas Guthruf

Stefan Lymbourides

Daniela Schmid

Project information

Running time: since 2016

Dr. med. et MME Nick Lüthi
Team leader of learning media

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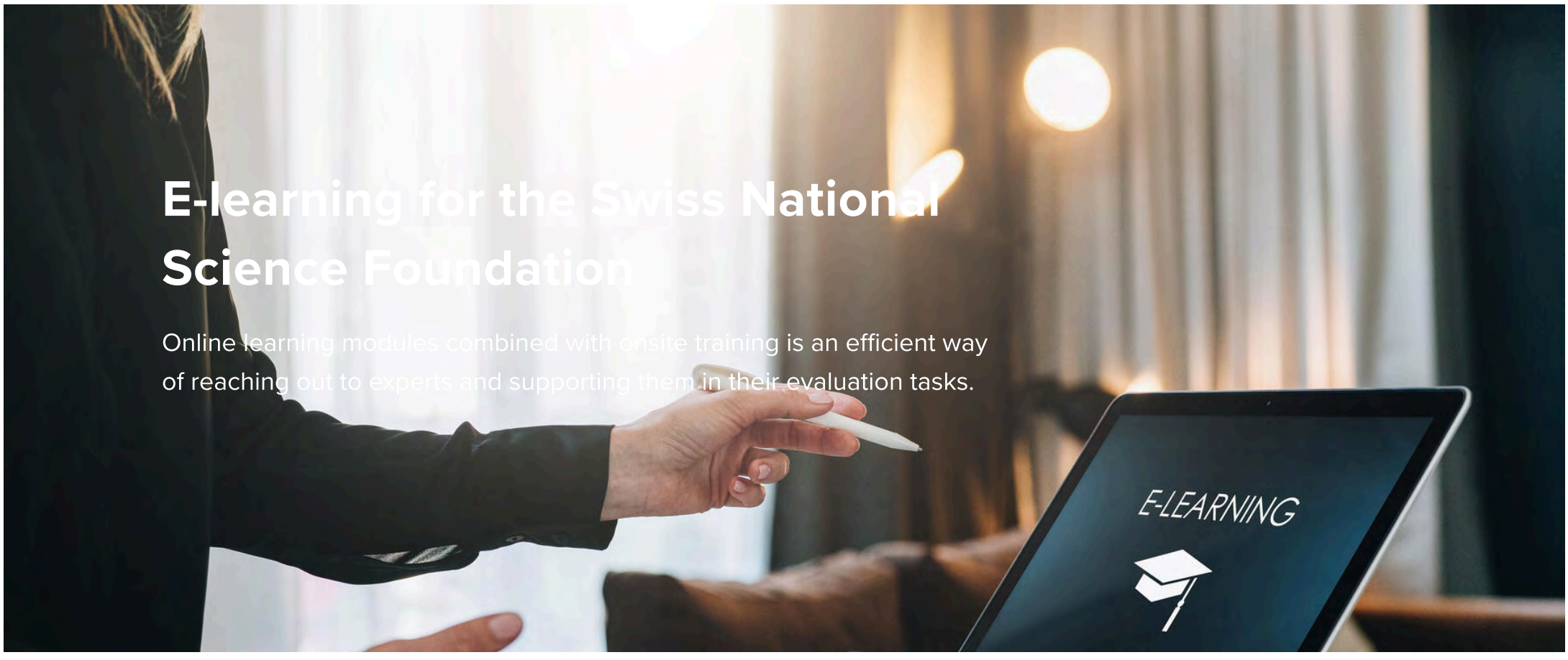


E-learning for the Swiss National Science Foundation

Online learning modules combined with onsite training is an efficient way of reaching out to experts and supporting them in their evaluation tasks.

2022 2023 2024 Service

The Swiss National Science Foundation (SNSF) aims to be an excellent funding body that funds excellent research. It therefore sets itself very high standards in terms of the quality, independence and fairness of its evaluation procedures. The evaluators, who are responsible for assessing the research proposals and are the cornerstone of the evaluation process, contribute significantly to this.

Providing training ensures that all panel members have a shared understanding of the SNSF's core evaluation principles and standards. This helps to ensure fair and consistent evaluations of research proposals, which is essential for directing funding to the most excellent and impactful projects. The e-learning platform is one of several measures to convey our evaluation standards efficiently and continuously to all evaluators.

Aims

Implementing online modules for panel members at the SNFS. Currently we have implemented two modules:

Bias in research funding

The module aims at increasing the awareness for biases in order to reducing them. We are all biased but often not aware of our biases. These implicit biases stem from unconscious cognitive processes that we use to simplify the vast amount of information we encounter.

Chairing of Evaluation panels

The module is a tutorial for panel chairs: The role of a panel chair is crucial in ensuring that the scientific evaluation of research proposals is conducted fairly, transparently, and in accordance with the highest standards. As leaders of the evaluation process, chairs have the responsibility to guide discussions, foster impartiality, and ensure that all panel members’ voices are heard while upholding the integrity of the process.

Ordering customer

Swiss National Science Foundation (SNSF)

Team

Sissel Guttormsen, Philippe Zimmermann, Priska Steiger with team IML

Project information

Project period: since 2022

E-Learning und Beratung für die Ärztekammer Niedersachsen

Beratung, Evaluation und Einbindung von eLearning für die Ärztekammer Niedersachsen (D).

2021 2022 2023 2024 Service Evaluation

Die Ärztekammer Niedersachsen (ÄKN) in Deutschland schreibt die Medizinische Lehre in der neuen Weiterbildungsordnung fest. Dies beinhaltet auch verpflichtende Vorgaben für die Qualifizierung von Ärztinnen und Ärzten, welche zur Durchführung von Weiterbildungen ermächtigt sind. Die Weiterbildung soll von hoher didaktischer Qualität sein, um die Motivation und Akzeptanz der Teilnehmerinnen und Teilnehmer zu sichern. Eine besondere Herausforderung stellt die grosse Anzahl Personen (ca. 4000) und deren Heterogenität dar. Der Heterogenität soll mit einem breiten Angebot an E-Learning Modulen und verpflichtenden didaktischen Trainings Rechnung getragen werden.

Ziele

Das neue Weiterbildungsprogramm der ÄKN wird neu entwickelt, eingeführt und evaluiert. Neben Beratung und Evaluation werden auch Lernmedien aus dem IML Fundus zur Verfügung gestellt. Das Programm soll im Sinne eines lernenden Systems weiterhin fortlaufend evaluiert und optimiert werden. Ein IML-Team unterstützt die ÄKN dabei, diesen Ziele zu erreichen.

Auftraggebende

Ärztekammer Niedersachsen (ÄKN) in Deutschland

Partner

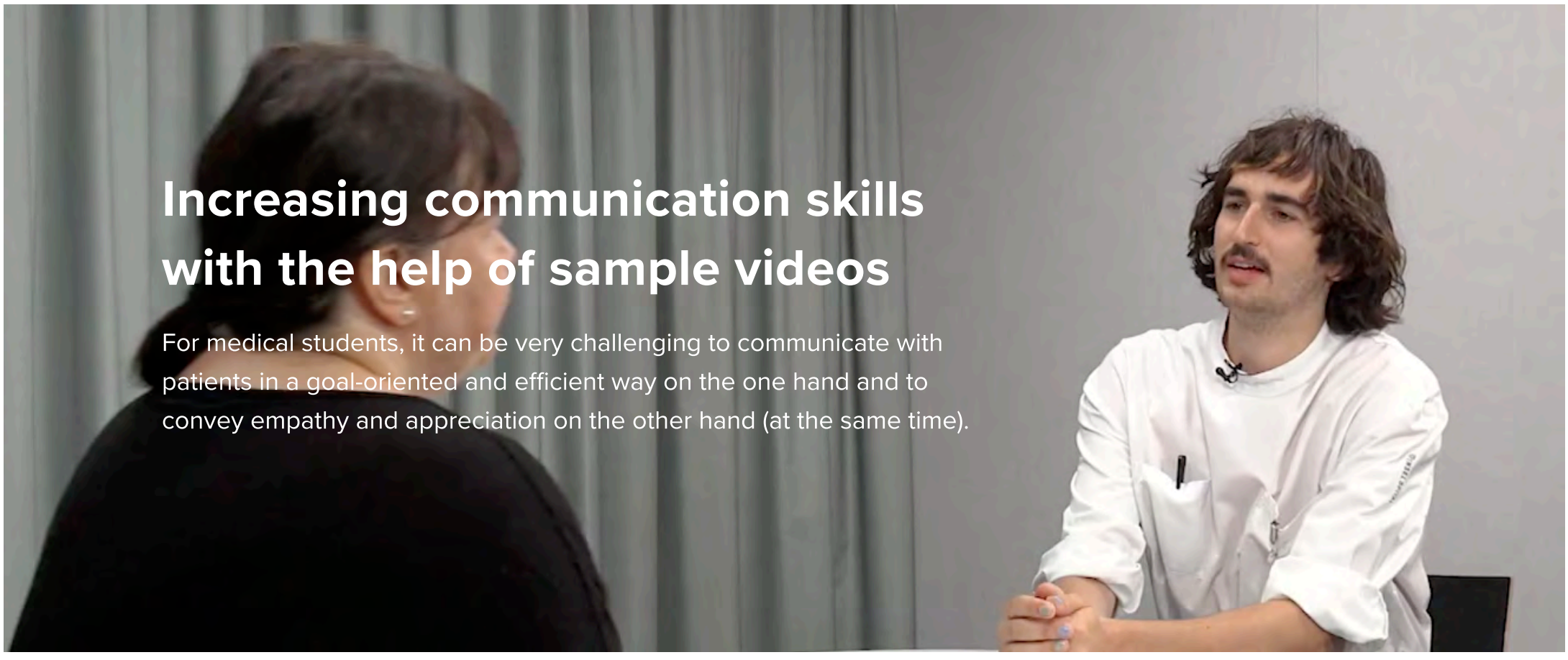
Prof. Hans-Jürgen Christen, Dr. med. Christina Quandt

Team

Sissel Guttormsen, Christoph Berendonk, Felicitas Wagner mit Team IML

Projektinformation

Laufzeit: 2021 - 2024



Increasing communication skills with the help of sample videos

For medical students, it can be very challenging to communicate with patients in a goal-oriented and efficient way on the one hand and to convey empathy and appreciation on the other hand (at the same time).

2022 2023 2024 Education

Since the students only very rarely receive feedback on their communication behaviour and they also observe such suboptimal behaviour from their superiors or role models, corresponding patterns are too rarely broken. In this way, corresponding misconduct can be passed on into the further education period (and beyond).

Aims

The project «Improving communication skills» aims to sensitise medical students to typical mistakes in patient:in conversations by means of example videos. In these examples, typical mistakes are contrasted with exemplary communication behaviour. The project is intended to give medical students the opportunity to recognise faulty communication behaviour early in their training - and to recognise which alternative forms of behaviour can be important for building a good doctor-patient relationship.

Team

Nick Lüthi, Felix Schmitz

Project information

Project period: 2021-2024

Dr. med. et MME Nick Lüthi
Team leader of learning media

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Berner longitudinales Curriculum Virtuelle Patient:innen Notfallmedizin (BelViP)

Unterstützung der Studierenden zum Erlernen der selbständigen Behandlung von pädiatrischen und erwachsenen Notfallpatienten durch Einsatz von Virtuellen Patient:innen.

2022 2023 2024 Research Education

Im Rahmen dieses Projektes werden insgesamt 13 pädiatrische und 13 adulte Virtuelle Notfall-Patient:innen entsprechend den EPA 6-Leitsymptomen (Behandlung eines Notfallpatienten) entsprechend dem Lernzielrahmenwerk PROFILES erstellt, begutachtet, pilotiert und fest mit dem übrigen Medizinstudium im Sinne von blended learning verankert (Nachbereitung Vorlesungen, begleitend zu Blockpraktika mit Online-Besprechung, begleitend zum Wahlstudienjahr, als Vorbereitung von Simulationen). Der Erfolg des Einsatzes wird durch Begleitstudien evaluiert.

Ziele

Ziel ist die Unterstützung der Studierenden beim Erlernen der selbständigen Behandlung von pädiatrischen und erwachsenen Notfallpatient:innen durch den blended learning Einsatz von Virtuellen Patient:innen.

Auftraggebende

Medizinische Fakultät Bern

Partner:innen

Dr. med. Isabelle Steiner, Chefärztin, Co-Leiterin Notfallzentrum für Kinder und Jugendliche

Prof. Dr. med. Thomas Sauter, Leitender Arzt Notfallmedizin

Finanzierung

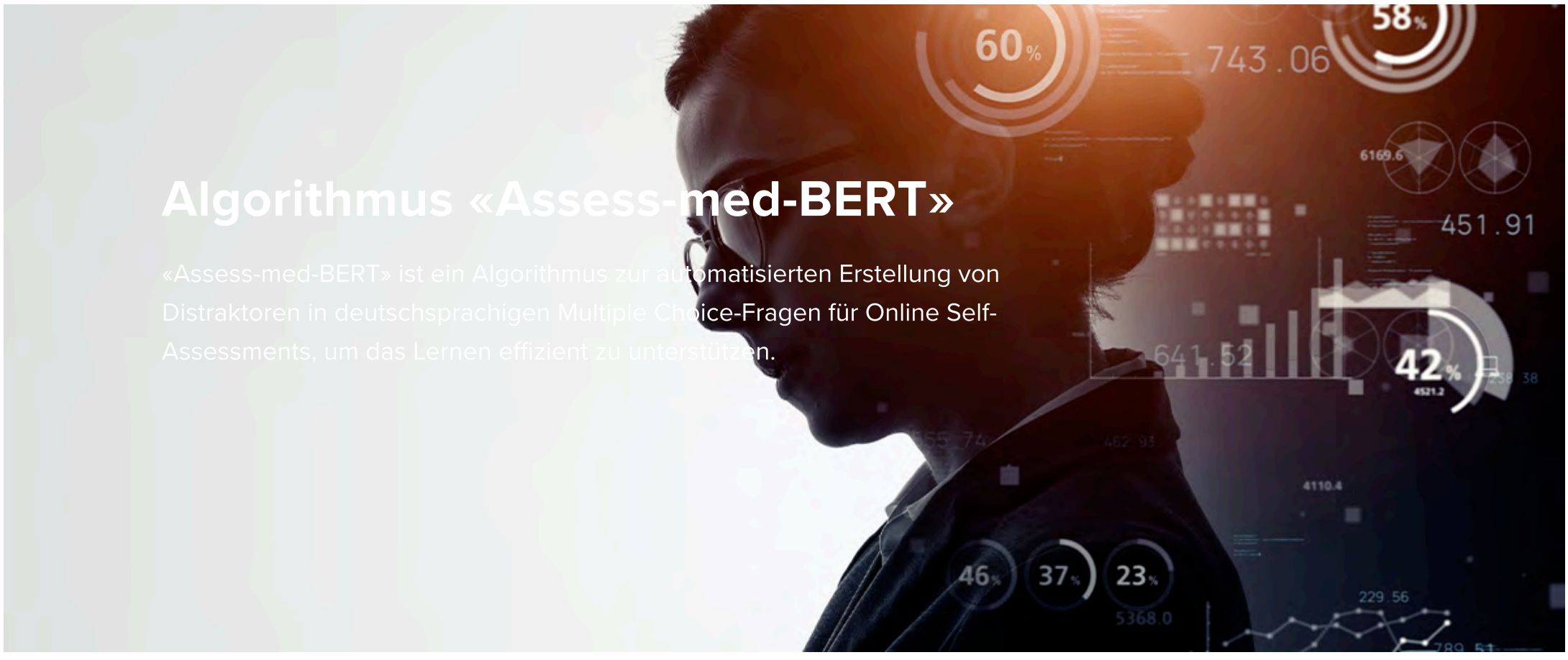
Finanziert durch die Medizinische Fakultät, Beschluss Ausschuss Lehre

Team

IML:
Prof. Dr. Dr. med. Sören Huwendiek (Abteilungsleiter AAE)
Dr. phil. Felicitas Wagner (Gruppenleiterin Evaluation AAE)

Projektinformation

Laufzeit: 2022 – 2024



Algorithmus «Assess-med-BERT»

«Assess-med-BERT» ist ein Algorithmus zur automatisierten Erstellung von Distraktoren in deutschsprachigen Multiple Choice-Fragen für Online Self-Assessments, um das Lernen effizient zu unterstützen.

2022 2023 2024 Research Education

Fachübergreifend zeigt sich, dass es zu wenig Übungsaufgaben (i.S. von Self-Assessments) für Lernende gibt, weil die Erstellung viel Zeit benötigt. Die vorhandene Forschung zur automatisierten Generierung von Übungsaufgaben bezieht sich weitgehend auf englischsprachige Datengrundlagen, welche nicht auf die deutsche Sprache übertragen werden können. Diese Lücke soll mit dem vorliegenden Projekt geschlossen werden. Das Projekt verfolgt das Ziel, das Lernen am Beispiel des medizinischen Kontexts im deutschsprachigen Raum zu verbessern, indem Lehrende effizienter Übungsfragen generieren (lassen) können, wodurch sich Lernende (sowohl Studierende als auch Weiterzubildende) durch die Verwendung dieser generierten Übungsaufgaben besser neues Wissen aneignen können.

Im vorliegenden Forschungsprojekt soll ein Modell auf Grundlage von künstlicher Intelligenz und NLP (Natural Language Processing) entwickelt werden, welches es Akteuren im Bildungsbereich ermöglicht, Lernmöglichkeiten (Self-Assessments) mit deutlich geringerem Aufwand als bisher zur Verfügung zu stellen.

Ziele

Das vorliegende Projekt soll Lernmöglichkeiten schaffen, die von Lehrenden ein Minimum an Ressourcen benötigen und gleichzeitig den Lernprozess über Feedback und Reflexion für die Lernenden transparenter, zielgerichteter, effizienter und effektiver machen. Durch das teilautomatisierte Erstellen von MCQs für Self-Assessments können gezielt Fragen in den Bereichen generiert werden, in denen Studierende grössere Probleme haben oder in denen es hilfreich wäre, noch mehr Übungsaufgaben zur Vertiefung zu erhalten. Damit unterstützt dieses Projekt das Lernen der Studierenden und bietet die Grundlage, um Studierenden zukünftig anhand ihrer Leistung in einem Self-Assessment auch weitere Self-Assessments oder Repetitionen vorzuschlagen, i.S. des adaptiven Lernens.

Auftraggebende

BeLearn

Partner:innen

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PD Dr. Katja Schlegel
Universität Bern, Institut für Psychologie, Fabrikstrasse 8
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Dr. Natalie Borter
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Finanzierung

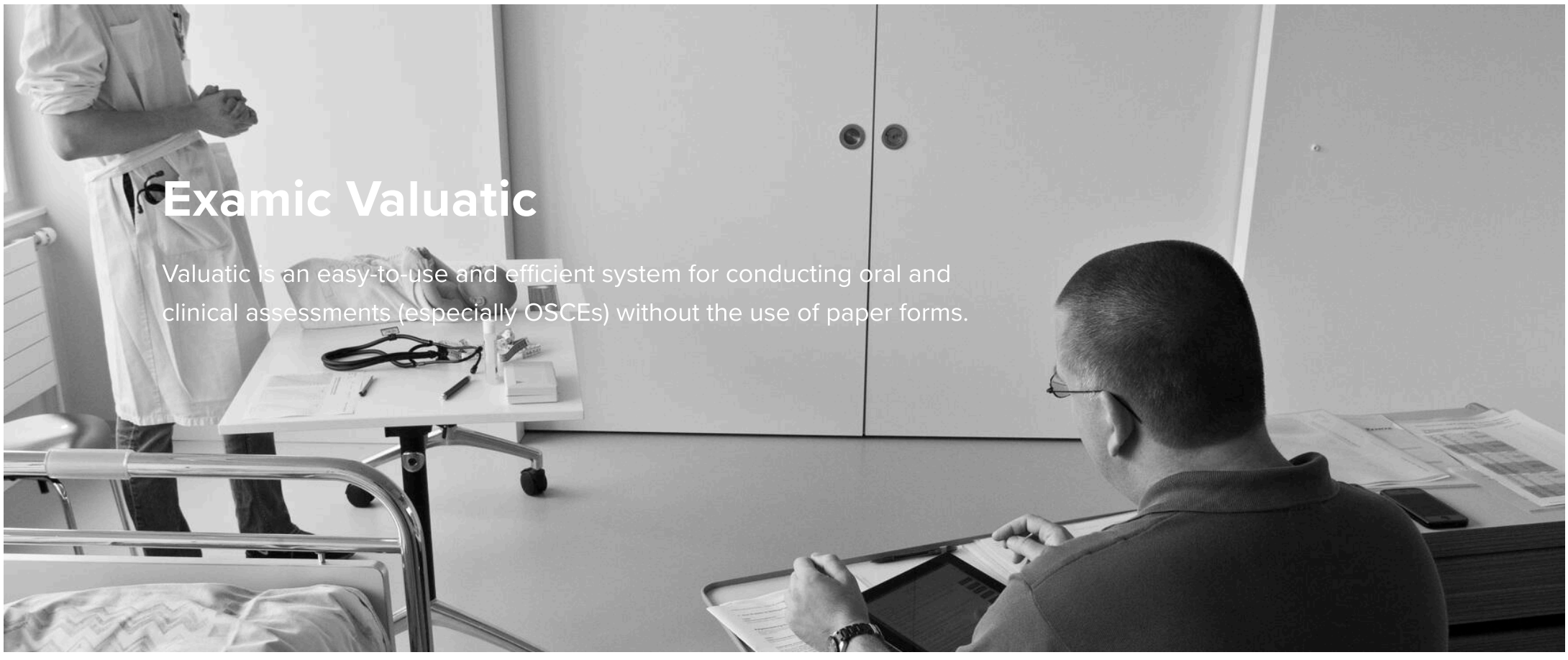
BeLearn

Team

IML: Dr. Rabea Krings (Projektleiterin), Dr. Dr. med. Eva Hennel, Prof. Dr. Dr. med. Sören Huwendiek

Projektinformation

Laufzeit: 2022 - 2024



Examic Valuatic

Valuatic is an easy-to-use and efficient system for conducting oral and clinical assessments (especially OSCEs) without the use of paper forms.

2021 2022 2023 2024 Assessment Development Examic Usability

Examic Valuatic is a new software system that will replace Examic EOSCE over the years. Valuatic is being developed with all the experience and feedback we have gathered over the last 10 years from our partners and in close collaboration with assessment practitioners who run OSCEs.

There are 2 Valuatic applications: **Valuatic Studio**, a Windows application that allows you to create, distribute and observe exams as well as collect and export results. And **Valuatic Touch**, an iOS application that allows examiners to assess candidates.

Valuatic has some powerful features, such as a wide range of item types within the checklists/forms, the ability to run random, not predefined schedules, scanning QR codes to select checklists, students and examiners, remote data distribution to iPads without even touching a tablet, customisable PDF reports and different server types to store the data.

Ordering customer

Medical Faculty University of Bern
Federal Office of Public Health FOPH
Institute for Medical Education

Target group

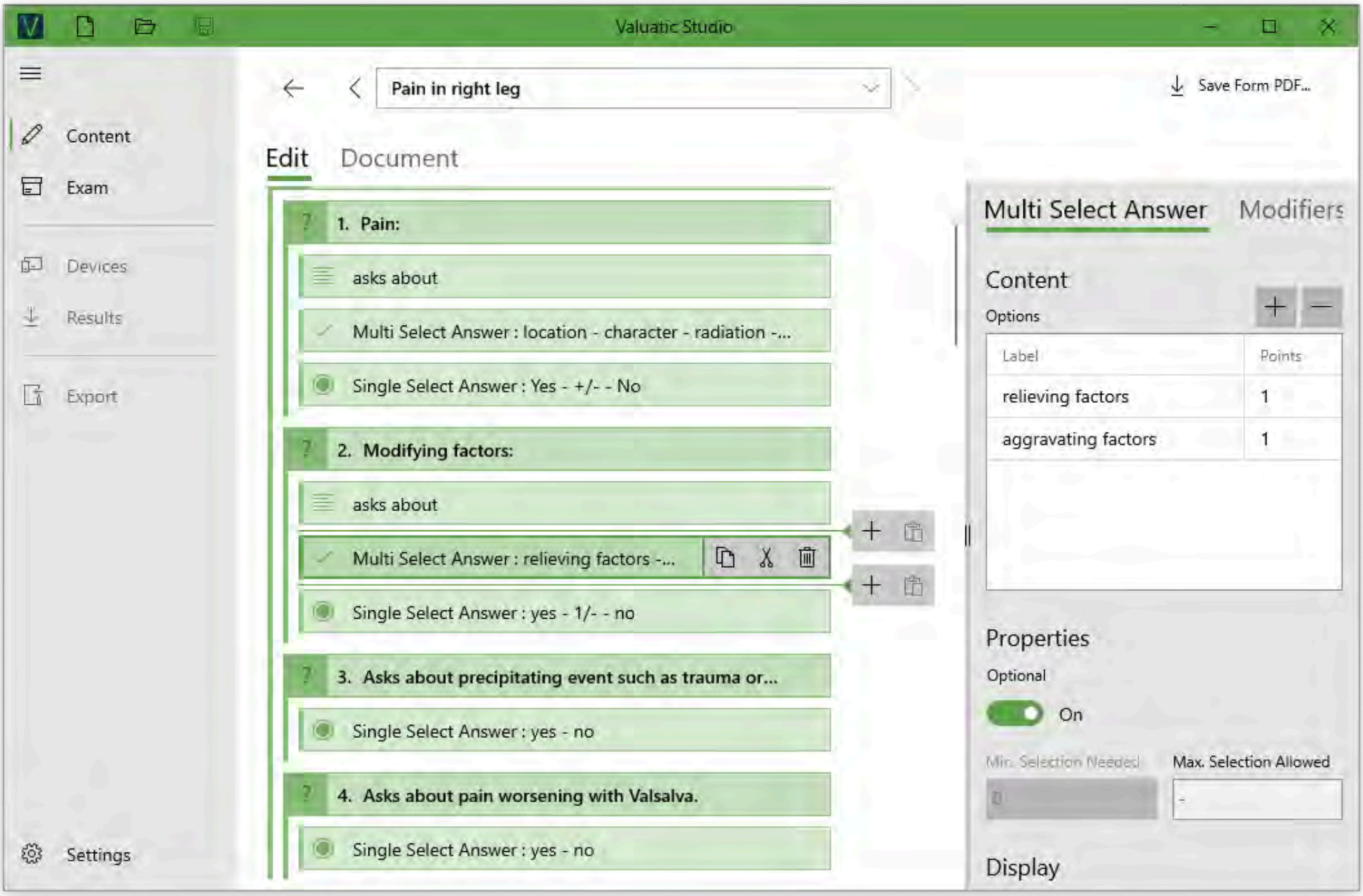
Everyone that administers or runs clinical or oral examinations, or evaluates the performance of people, products or processes (OSCE exams, evaluations, surveys, product evaluations, vocational training, quality controls, checklists, etc.)

Team IML

Hansmartin Geiser, Florian Goll, Stephan Schallenberger, -Christian Steck, Florian Neubauer, Philippe Zimmermann, Barbara Zurbuchen

Publications

https://valuatic.com/news/


Valuatic Studio
Content
Exam
Devices
Results
Export
Settings
Pain in right leg
Save Form PDF...
Edit
Document
1. Pain:
asks about
Multi Select Answer : location - character - radiation -...
Single Select Answer : Yes - +/- - No
2. Modifying factors:
asks about
Multi Select Answer : relieving factors -...
Single Select Answer : yes - 1/- - no
3. Asks about precipitating event such as trauma or...
Single Select Answer : yes - no
4. Asks about pain worsening with Valsalva.
Single Select Answer : yes - no
Multi Select Answer
Modifiers
Content
Options
Label
Points
relieving factors
1
aggravating factors
1
Properties
Optional
On
Min. Selection Needed
Max. Selection Allowed
0
-
Display

Project information

Running time: since 2018

Link

Further Information

Valuatic.com

Dr. sc. ETH Philippe Zimmermann
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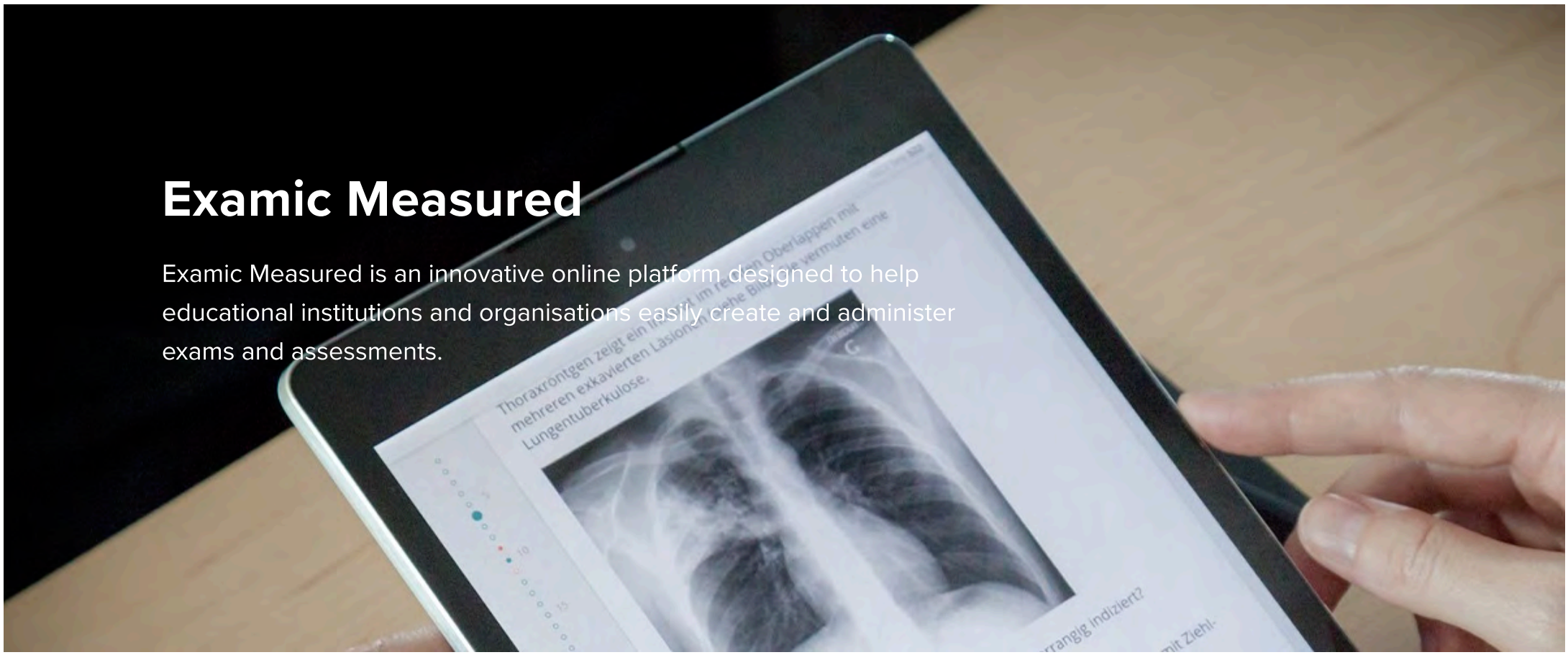


Examic Measured

Examic Measured is an innovative online platform designed to help educational institutions and organisations easily create and administer exams and assessments.

2017 2018 2019 2020 2021 2022 2023 2024 2025 Assessment Service Development Examic Usability

Measured offers a wide range of features and advantages that make it an ideal solution for educators, administrators, and students alike.

Aims

Development of an application suite to support the entire assessment cycle of written examinations.

Ordering Customer

Federal Office of Public Health
Faculty of Medicine, University of Bern
Institute for Medical Education

Team IML

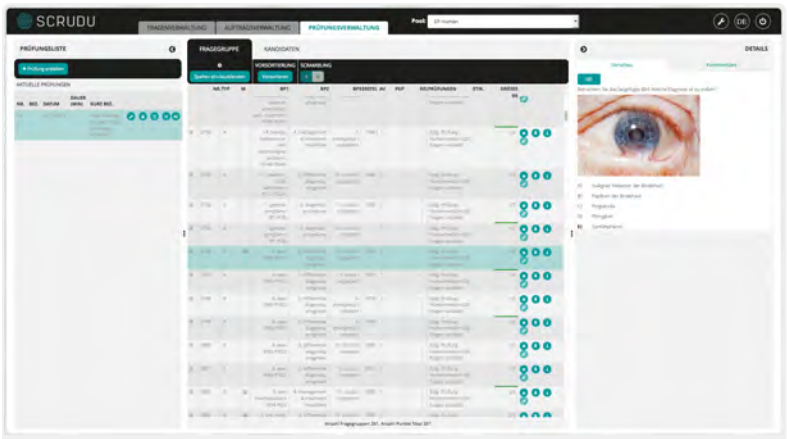
Radan Antic, Andreas Beschorner, Karin Braun, Raphael Breukel, Neil Docherty, Corinne Dreifuss, Florian Goll, Jana Henschel, Patrick Jucker-Kupper, Benjamin König, Rabea Krings, Jeanne Kunz, Roger Meier, Vladimir Pavlyukov, Lukas Rieder, Stephan Schallenberger, Tina Schurter, Priska Steiger, Daniel Stricker, Philippe Zimmermann, Elisabeth Zwahlen

Target group

Educational institutions and organisations that create, administer, run or analyse exams: students, teaching and administrative staff of Higher Education Institutions

Project information

Running time: since 2017



Examic Measured

LINK

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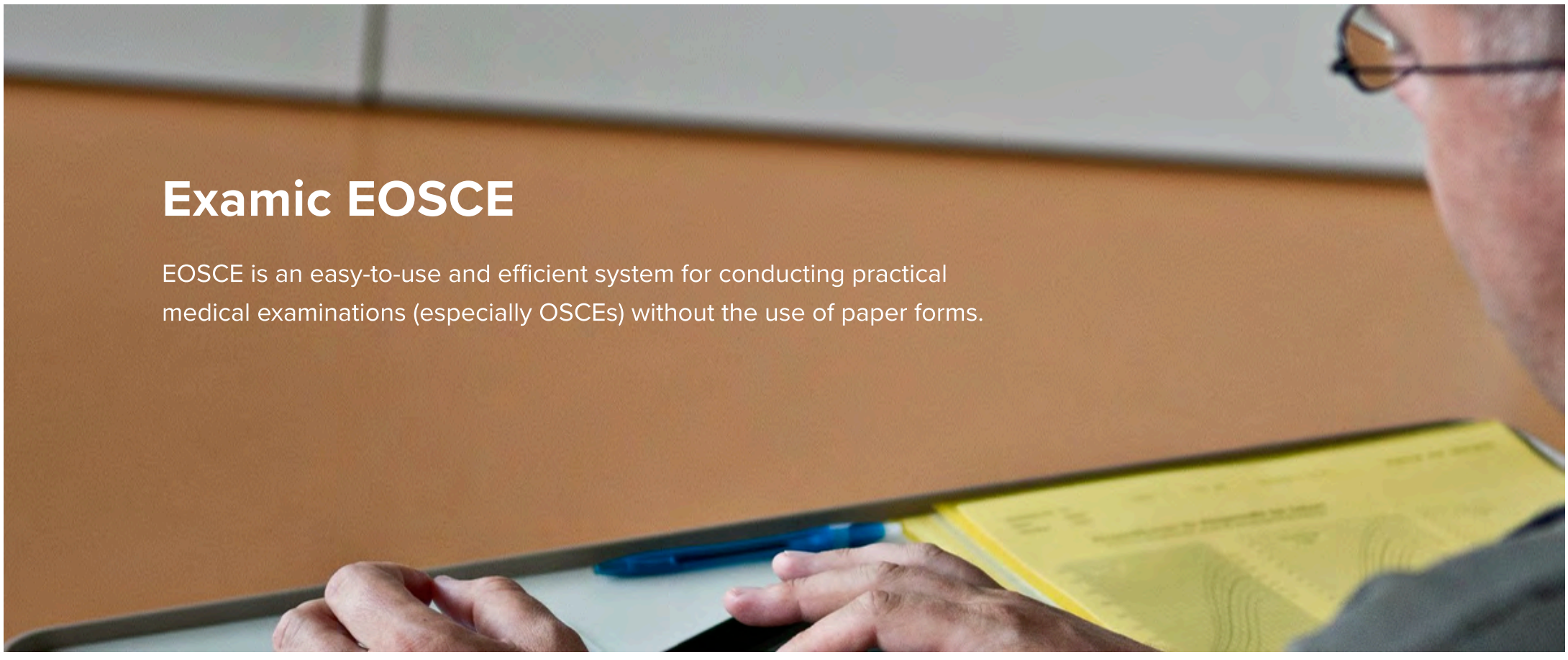

Examic EOSCE

EOSCE is an easy-to-use and efficient system for conducting practical medical examinations (especially OSCEs) without the use of paper forms.

2016 2017 2018 2019 2020 2021 2022 2023 2024 Assessment Service Development Examic Usability

Assessments using EOSCE have less erroneous or missing data than exams using paper checklists and can be analysed immediately after the exam. The three EOSCE applications help exam administrators to easily setup and monitor an exam and download results centrally. It helps examiners focus on candidate performance through visual aids in the user interface. Assessments are conducted on iPads and can be run with a central server as an additional layer of security or completely offline.

Aims

Development of an application suite to support Objective Structured Clinical Examinations (OSCE).

Ordering customer

Federal Office of Public Health
Faculty of Medicine, University of Bern
Institute for Medical Education

Team IML

Christoph Berendonk, Sabine Feller, Hansmartin Geiser, Florian Goll, Natascha Lüthy, Christian Steck, Daniel Stricker, Philippe Zimmermann

Target group

Educational institutions and organisations that create, administer, take or analyse exams: examiners, teaching and administrative staff of Higher Education Institutions

Project information

Running time: 2008 - 2024

Links

EOSCE

Examic Assessment Suite

Story «10 years of clinical skills exams with Examic EOSCE»

Dr. sc. ETH Philippe Zimmermann
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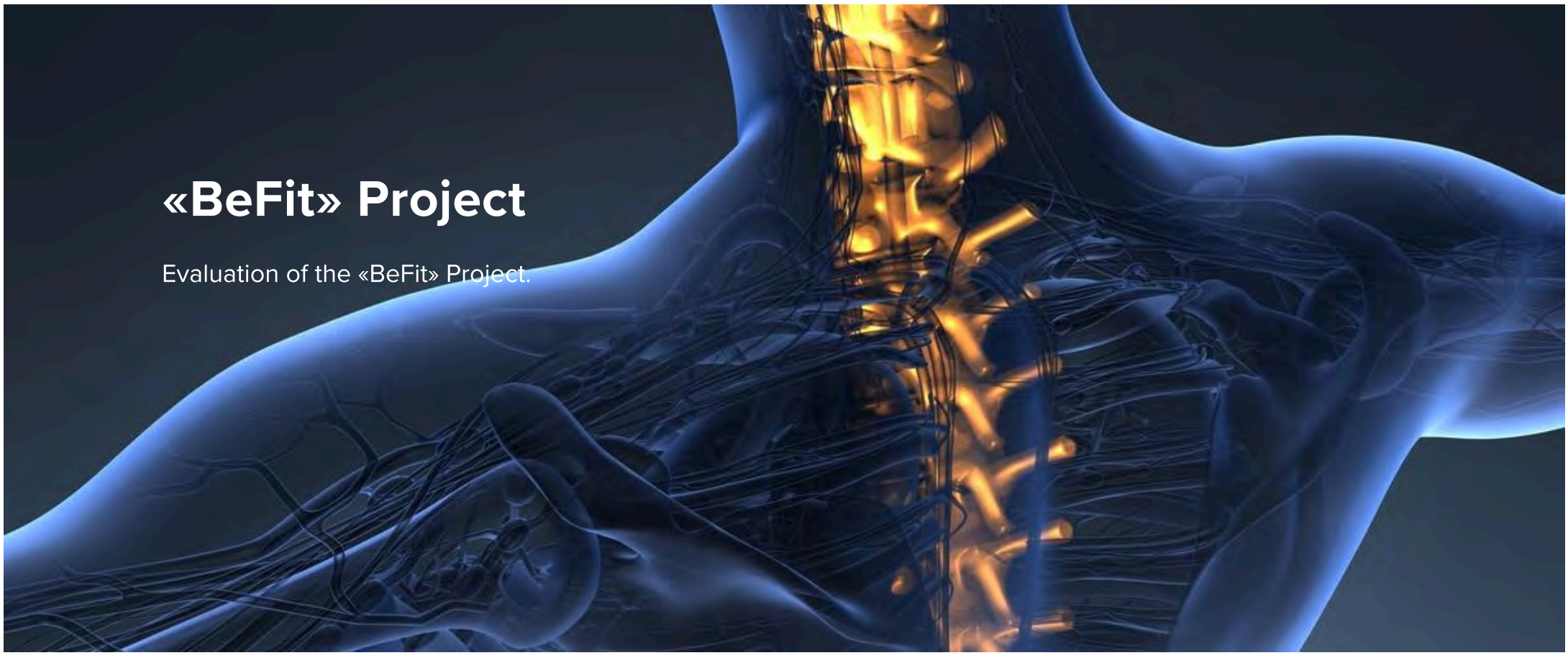

«BeFit» Project

Evaluation of the «BeFit» Project.

2020 2021 2022 2023 2024 2025 Service Evaluation

The «BeFit» project aims to improve the physical activity of ankylosing spondylitis sufferers via the promotion of a specific training concept, thereby improving their quality of life. It also seeks to implement this concept throughout Switzerland.

Aims

The aim of the evaluation is to follow the BeFit project throughout its entire duration and to assess its results and effects.

Client

Health Promotion Switzerland (GFCH)

Co-workers

Felicitas Wagner, Barbara Zurbuchen, Corinne Dreifuss, Sören Huwendiek

Project information

Running time: 02/2020 - 04/2025

Dr. phil. Felicitas Lony Wagner
Scientific collaborator

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Evaluation von Praxisassistenzen

Überarbeitung der Erhebungsinstrumente für die Evaluation von Praxisassistenzen.

2023 2024 Evaluation

Überarbeitung der bestehenden Fragebögen zur Evaluation von hausärztlichen Praxisassistenzen.

Ziele

Die bestehenden Fragebögen sollen so angepasst werden, dass diese auch für andere Fachbereiche eingesetzt werden können.

Auftraggebende

Schweizerisches Institut für ärztliche Weiter- und Fortbildung (SIWF)

Team

Felicitas Lony Wagner, Kexel Ann-Kathrin Lea, Sören Huwendiek

Projektinformation

Laufzeit: 06/2023 – 01/2024

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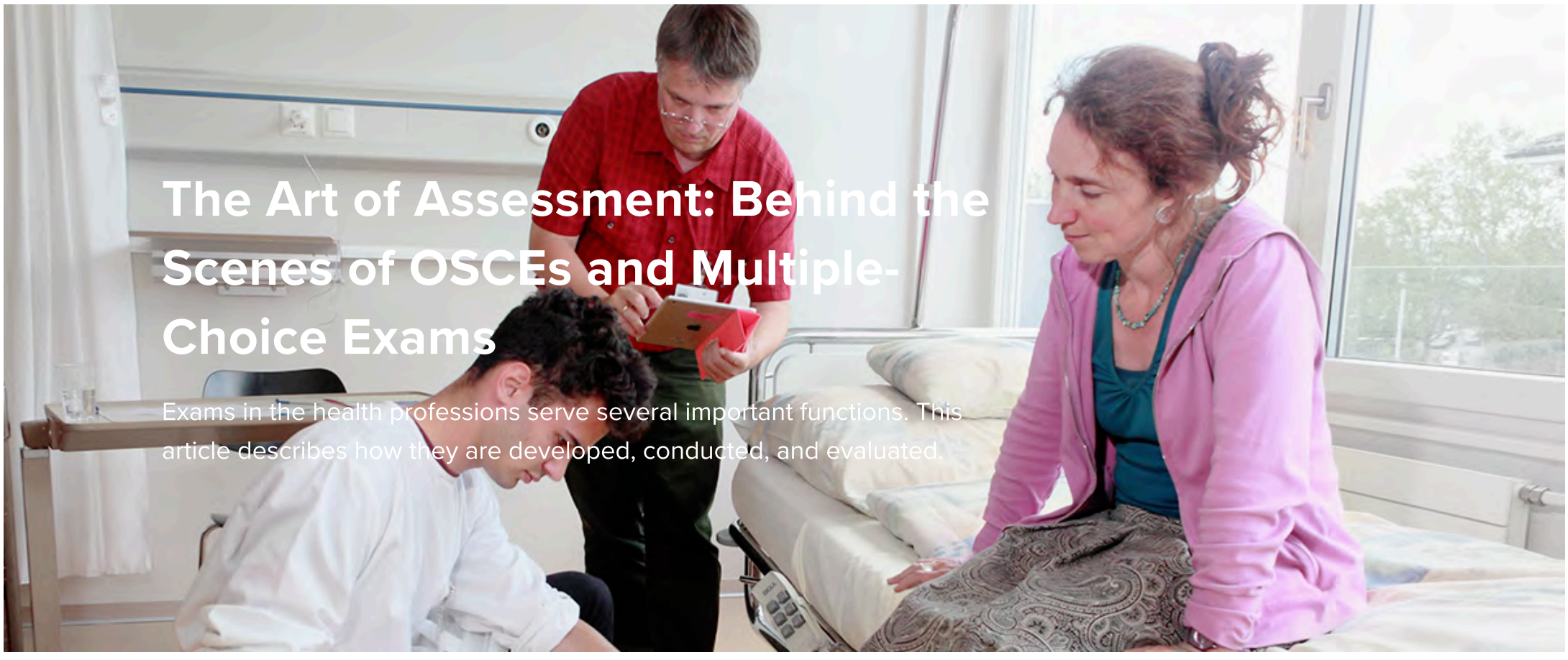

The Art of Assessment: Behind the Scenes of OSCEs and Multiple-Choice Exams

Exams in the health professions serve several important functions. This article describes how they are developed, conducted, and evaluated.

Text: Dr. med. Dr. phil. et MME Florian Neubauer, 18.02.2025

2024 2025 Assessment Service Development

Exams are a central instrument for assessing the individual competencies of students. They provide a significant incentive to study. They ensure the quality of training programmes by bringing experts together to reflect on what students should actually be learning in line with the training objectives. This way, they exert a positive influence on the refinement of these objectives. Overall, the quality of exams mirrors the commitment of the educational institutions responsible for training the students.

In the field of medicine, two types of exams have emerged as particularly significant: the Objective Structured Clinical Examination (OSCE), which assesses clinical skills, and the written multiple-choice exam, which evaluates medical knowledge.

OSCEs: Simulating Clinical Tasks

The OSCE is a practice-oriented form of exam designed to evaluate the clinical abilities students have acquired. In an OSCE, students are presented with an authentic clinical problem (e.g., a patient who arrives in the emergency department with a cough and fever). The patient's concerns and symptoms are convincingly portrayed by actors in the role of standardised patients. An OSCE typically consists of eight to twelve successive clinical tasks, called "stations." In this way, students' competencies can be independently assessed in different clinical situations by multiple examiners, which significantly enhances the reliability of the exam scores.

Development and Preparation: Designing an OSCE is a complex process involving numerous individuals from a range of disciplines. First, based on the training objectives for the relevant educational programme, domain experts determine which clinical skills need to be assessed. Building on this, various stations are devised to simulate specific scenarios drawn from medical practice. These include taking a patient's history, performing physical exams, and deciding on the next diagnostic and therapeutic steps. Professional and patient-focused communication is a central aspect of every station. Developing detailed case descriptions and corresponding marking schemes tailored precisely to each patient presentation is crucial for ensuring that examiners can fairly and reliably evaluate students' performance.

In the subsequent quality control phase, which includes multiple steps, the stations are reviewed through peer review. Quality control comprises joint workshops with OSCE methodology specialists and experienced clinicians, as well as a final evaluation of the correctness by an exam board. Once the optimised patient scenarios have been completed, the standardised patients practise intensively to portray symptoms and behaviours consistently, so that all students are assessed under comparable conditions.

Conducting the Exam: Proper logistics are vital for the smooth running of an OSCE exam. Rooms must be arranged, timetables devised, and a sufficient number of examiners recruited, invited, and briefed. Each station is allotted a precisely defined time slot, after which students rotate to the next station. Examiners must be both clinically proficient and trained to use the rating instruments properly so that students demonstrating the same level of performance receive the same score. Exam performance is recorded digitally according to predefined criteria.

Evaluation: After the exam, the digitally recorded rating forms are analysed. Statistical methods are employed to guarantee the reliability of the exam and the validity of its results. Any irregularities, such as ambiguous marking criteria or unusually high or low marks from individual examiners, are identified and taken into account for the benefit of the students. Additionally, feedback from both examiners and students is evaluated in order to refine each station and improve future iterations of the exam as a whole.

Multiple-Choice Exams: Efficient Knowledge Measurement through Precise Questions

Multiple-choice exams are widespread in medicine due to their efficiency and objectivity. Well-designed multiple-choice questions presenting nuanced patient scenarios can measure cognitive competencies related to clinical decision-making as well as the application of medical knowledge.

Development and Preparation: Writing high-quality multiple-choice questions is an art in itself. A patient scenario must be described in such a way that a particular diagnosis is clearly the most likely, or that a specific medical approach is clearly the best option in the given circumstances, without it being obvious from the outset what action is required. The question that follows must be formulated unambiguously to avoid misunderstandings. The answer choices must include the correct solution and several options that may appear plausible but are definitively less appropriate. These so-called ‘distractors’ represent typical misconceptions about the patient’s situation and thus test students’ real understanding. Another challenge is to phrase the questions so that they provide no unintended clues about the correct answer.

Conducting the Exam: To safeguard the purpose of the exam—namely, to measure students’ competencies—and to maintain fairness, cheating and other dishonest methods must be prevented. Clear rules, instructions at the start of the exam, surrender of mobile devices, and a spacious seating plan can help achieve this. A quiet, orderly setting is also aimed for, so that students can focus fully on their tasks. Thanks to software developed by the IML, multiple-choice exams can be efficiently administered and evaluated.

Evaluation: Once thorough double-checks have been completed, exam results are communicated to students. Behind the scenes, detailed item analyses are performed, calculating statistical indices such as the difficulty index and item discrimination to gauge the quality of each question. Here, too, feedback from students and examiners is closely reviewed to identify ways to enhance the exam in future.

Common Challenges for OSCEs and Multiple-Choice Exams

Both exam formats face the same challenge: how to ensure that they remain relevant and reliable in the long term. An exam that makes clinical sense and is methodologically sound not only assesses the relevant competencies of students more accurately but also provides students with a much better incentive to learn,

helping them prepare optimally for a career in medicine. How, then, can exams be continually improved and kept up to date?

This must primarily be addressed on a content level by constantly asking which new learning objectives—driven by changes in society and medicine—should be included, and which content can be removed from the exam because it is outdated. It also requires regular training in exam methodology for those involved in creating exams and evaluating exam performance. The use of state-of-the-art hard- and software supports the efficiency of the exam process and the objectivity of the assessments. Ongoing improvements in rating criteria, informed by psychometric research, are also part of this continuous development.

Conclusion

The development, preparation, administration, and evaluation of OSCE and multiple-choice exams represent a complex endeavour requiring meticulous planning and multifaceted expertise. By applying recognised standards and continually improving both content and methodology, exams can be designed to meet the highest demands. In doing so, they contribute to training competent doctors who are well prepared for professional practice.

The IML has been active for over 50 years as a national centre of expertise in exam services, taking a leading role in more than 240 exams in Switzerland. It supports the University of Bern, the federal government, and many other clients by providing its expertise in designing, conducting, and analysing exams of the highest quality.

Publications

Schurter T, Escher M, Gachoud D, Bednarski P, Hug B, Kropf R, Meng-Hentschel J, König B, Beyeler C, Guttormsen S, Huwendiek S. Essential steps in the development, implementation, evaluation and quality assurance of the written part of the Swiss federal licensing examination for human medicine. GMS J Med Educ. 2022 Sep 15;39(4):Doc43. doi: 10.3205/zma001564.

Wagner FL, Feller S, Schmitz FM, Zimmermann PG, Krings R, Guttormsen S, Huwendiek S. Usability and preference of electronic vs. paper and pencil OSCE checklists by examiners and influence of checklist type on missed ratings in the Swiss Federal Licensing Exam. GMS J Med Educ. 2022 Apr 14;39(2):Doc24. doi: 10.3205/zma001545.

Lahner FM, Schauber S, Lörwald AC, Kropf R, Guttormsen S, Fischer MR, Huwendiek S. Measurement precision at the cut score in medical multiple choice exams: Theory matters. Perspect Med Educ. 2020 Aug;9(4):220-228. doi: 10.1007/s40037-020-00586-0.

Monti M, Klöckner-Cronauer C, Hautz SC, Schnabel KP, Breckwoldt J, Junod-Perron N, Feller S, Bonvin R, Huwendiek S. Improving the assessment of communication competencies in a national licensing OSCE: lessons learned from an experts' symposium. BMC Med Educ. 2020 May 26;20(1):171. doi: 10.1186/s12909-020-02079-4.

Guttormsen, S., Beyeler, C., Bonvin, R., Feller, S., Schirlo, C., Schnabel, K. P., Schurter, T., & Berendonk, C. (2013). The new licencing examination for human medicine: from concept to implementation. Swiss Med Wkly, 143(w13897), 1–10.doi:10.4414/smw.2013.13897.

Further information

Exam services

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Two great international conferences on medical education in Basel with IML engagement

In 2024, two well-established international health profession education conferences were held in Switzerland, which are also of great importance to the IML: One was the conference of the ‘Association for Medical Education in Europe’, AMEE, and the ‘4th World Summit in Competency-Based Education in Healthcare Professions’.

Text: Prof. Dr. Dr. med. et MME Sören Huwendiek, 18.02.2025

2024 Research Event

I) AMEE 2024

AMEE (Association for Medical Education in Europe) held its annual conference at the Basel Exhibition and Congress Centre from 24 to 28 August 2024.
The event attracted a total of 3,319 participants from all over the world on site and a further 674 online. Under the motto ‘Develop your educational career: Connect, Grow and Inspire with AMEE 2024’ the conference focused on using existing knowledge to guide practice, developing new knowledge and reflecting on the benefits for learners, patients and society. The aim was to promote excellence, collaboration and scientific work in the field of healthcare professions.
The program included a variety of plenary lectures, symposia, workshops and discussion panels, including numerous contributions on the possibilities of using artificial intelligence. The keynote speeches were as follows:

- Jim Campbell (World Health Organisation): He emphasised the need to increase health workforce training by 8-12% annually to achieve global health goals.

- Prof Liz Grant (University of Edinburgh): She highlighted the close link between climate change and global health and emphasised the responsibility of the health professions in this context.

- Dr Jamiu Busari (Horacio Oduber Hospital, Aruba/Maastricht University, Netherlands): He used Aristotle's teachings to examine prejudice and discrimination in health professions education and argued for more social justice in education and training programs. This final lecture of the AMEE particularly struck a chord with the participants and was rewarded with a standing ovation.

In addition to the scientific sessions, the conference also offered networking opportunities and social activities to promote exchange between the participants. Basel presented itself as a hospitable city with a wide range of cultural activities. Overall, AMEE 2024 in Basel provided an excellent platform for the exchange of the latest developments and best practices in health professions education and contributed to the further development of this important field.

Participation of IML in the organisation:

Organisation:

Huwendiek S: Member of the Programme Committee

Huwendiek S & Brodmann-Maeder M: Opening speech on behalf of the Swiss Health Professions Educators

Scientific contributions from the IML:

Gogollari, A., Schnabel, K., Schmitz F., Huwendiek, S., Gysin, S., Schirlo, Ch., Tolks, D., Schauber, S., **Guttormsen, S.** (2024). Exploring Digital Learning and Teaching (DLT) Perceptions Among Swiss Medical Students: A Nationwide Survey. Presented as ePoster at AMEE 2024, Basel Switzerland, 24 – 28 August 2024

Mitchell, S., Schmitz F., Guessous, I. Janczukowicz J. Guttormsen S. (2024)
Learning effects of an online learning intervention for skills acquisition using simulated patient encounters: a controled field study. Short presentation at AMEE Basel Switzerland, 24 – 28 August 2024

Caretta-Weyer H, **Huwendiek S**, Barone M, Young YQ, Richardson D, Touchie C: The Nuts and Bolts: Designing and Implementing Programmatic Assessment for CBME, preconference at AMEE Basel Switzerland, 24 – 28 August 2024 workshop

Lerch S, **Huwendiek S**, Nendaz M, Klöppel S, Pinilla S: A qualitative study to explore residents' perceptions of ad hoc entrustment, need for supervision and coping strategies, short communication at AMEE Basel Switzerland, 24 – 28 August 2024

II) CBME World Summit 2024

The '4th World Summit in Competency-Based Education in Healthcare Professions: Advancing global implementation' took place directly before the AMEE conference on 22 and 23 August 2024, also in Basel. The event brought together international experts from various healthcare professions to advance the global implementation of competency-based education (CBE). The aim of the summit was to promote systematic studies on processes and practices, disseminate information on CBE and support the application of research findings in this field. The programme included plenary lectures, symposia, workshops and short presentations, which offered participants a wide range of opportunities for exchange and collaboration. There were also 'Coffee in assigned buzz groups' to promote networking in particular.
The four plenary lectures were each organised interactively by 3-4 speakers from different continents with keynote speeches and a moderator. The following topics were addressed in detail:

1. plenary lecture: 'Competency based education in the health professions: Implementation across borders'
2. plenary lecture: 'Voices from the frontline: Learner & Teacher lived experiences with CBE',
3. plenary lecture 'CBE Outcomes: What do we know so far?'
4. plenary lecture 'Where to? A vision for the future of CBE'

The summit was aimed at anyone interested in competency-based education in the healthcare professions, regardless of their level of experience. It provided a platform for the exchange of the latest findings and best practices to promote excellence in the education and training of healthcare professionals worldwide. In addition to international participation, the event was attended by a broad range of participants from the IML and medical faculties in Switzerland.

Participation of the IML:

Organisation:

Huwendiek S: Co-Chair & Member of the Organising Committee

Contributions:

Brodmann-Maeder M, Schumacher D, **Huwendiek S**, Frank J: Opening of the Summit

Ryan M & **Huwendiek S**: Workshop on Programmatic Assessment

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Simulationspersonen Programm

Simulationspersonen in Lehre und Prüfungen einzusetzen, ist an der Universität Bern fest verankert. Das Institut für Medizinische Lehre (IML) ist bestrebt, diese Methode laufend weiterzuentwickeln, um so Medizinstudierenden eine sichere Lernumgebung und realistische Prüfungssituationen für praktische Fertigkeiten zu bieten.

18.02.2025

Herzlich willkommen!

Seit 2002 werden an der Medizinischen Fakultät der Universität Bern Simulationspersonen (SP) bei Prüfungen und seit 2009 auch im Kommunikationstraining eingesetzt. Sie kommen vorwiegend in der Ausbildung von Medizinstudent:innen und bei deren Prüfungen zum Einsatz.

Wir bilden Simulationspersonen (SP) für den Einsatz an Trainings, Prüfungen und für Schulungsvideos im medizinischen Umfeld aus. Derzeit organisieren wir Skillstrainings und Prüfungen von mehr als viele hunderte Studierende pro Jahr aus verschiedenen Lehrgängen und auf mehreren Ausbildungsstufen.

Wir schaffen sichere, messbare und authentische Lern- und Prüfungserfahrungen für alle Studierenden der Medizinischen Fakultät in Bern. Wir unterstützen auch andere Institutionen und Kund:innen bei der Umsetzung ihrer Projekte.

Da über die Jahre sowohl die Anzahl der Prüfungen als auch die der Kommunikationstrainings mit SP zugenommen haben, ist seitdem sowohl deren Zahl als auch das Team der SP-Trainer:innen kontinuierlich gewachsen. Derzeit sind mehr als 230 SP in unserem Programm tätig. Das Spektrum der Projekte erweitert sich stetig und so gibt es inzwischen auch vereinzelte Einsätze in der Ausbildung anderer Berufsgruppen bzw. in der Weiterbildung.

> “
> Simulationspatientinnen und Simulationspatienten (SPs) haben, um diese mal mehr, mal weniger ernst gemeinte Assoziation zu zerstreuen, nichts mit Hypochondern zu tun. Es handelt sich dabei um (Laien-) Schauspielerinnen und Schauspieler, die speziell geschult werden und im Rahmen von Aus-, Fort- und Weiterbildung im Gesundheitswesen die Rolle von Patientinnen und Patienten übernehmen, um glaubwürdige Übungs-, Prüfungs- und Feedbackszenarien zu ermöglichen (vergl. [1, 2]).
>
> — Peters T., Thrien C. (Hrsg.): Simulationspatienten», S. 13 (ISBN 9783456857565) © 2018 Hogrefe Verlag, Bern.

Unsere Vision und Mission

Vision

Optimale Unterstützung von Studierenden und Gesundheitsfachpersonen beim Erlernen und Prüfen von praktischen sowie kommunikativen Fertigkeiten.

Mission

Wir rekrutieren und schulen Profi- sowie Laienschauspieler:innen als SP zur Simulation von Personen in medizinisch relevanten Rollen.

Wir sorgen für sichere und unterstützende Arbeitsbedingungen der SPs und Mitarbeitenden.

Wir ermöglichen durch ihren Einsatz den Lernenden Selbst-Reflexion, effizientes Lernen und faire Prüfungen.

Wir leisten damit einen Beitrag zur medizinischen Aus-, Weiter- und Fortbildung, der am Ende den Patient:innen und dem Schweizer Gesundheitssystem gleichermassen zu Gute kommt.

https://www.aspeducators.org/standards-of-best-practice-
https://www.inacsl.org/healthcare-simulation-standards-ql
https://pubmed.ncbi.nlm.nih.gov/31211226/

Weitere Informationen

Microsite SP-Programm

Genauere Angaben zum Simulations-personen Programm des IMLs finden Sie hier.

Weiterbildung

CAS in Human Simulation

Aufbau und Weiterentwicklung von Simulationspersonen Programmen

Programmstart: März 2026

Weiterlesen

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FRONTLINERS: Evidence based blended learning on Precision Medicine

Teaching precision medicine to primary care professionals: General Practitioners, Pharmacists, Advance practice nurses.

Text: Prof. Dr. phil. Sissel Guttormsen Schär, Sharon Mitchell, 18.02.2025

2023 2024 2025 Research Education

PROJECT BACKGROUND

The objective of the Frontliners initiative is to implement an evidence-based training programme in precision medicine targeting frontline healthcare professionals. The design phase of this training is built upon three focus areas including content development, research and communications (Figure 1). Since 2019, the project team has continued to build each of these focus areas with an end goal of implementing an online evidence-based training programme, presenting quality interactive modules on key topics in precision medicine, which can be combined with onsite training. The complete Platform was first released in November 2024, containing 5 modules (Figure 2). The project team aims at continuing to develop and include new modules to the platform in close cooperation with content experts.

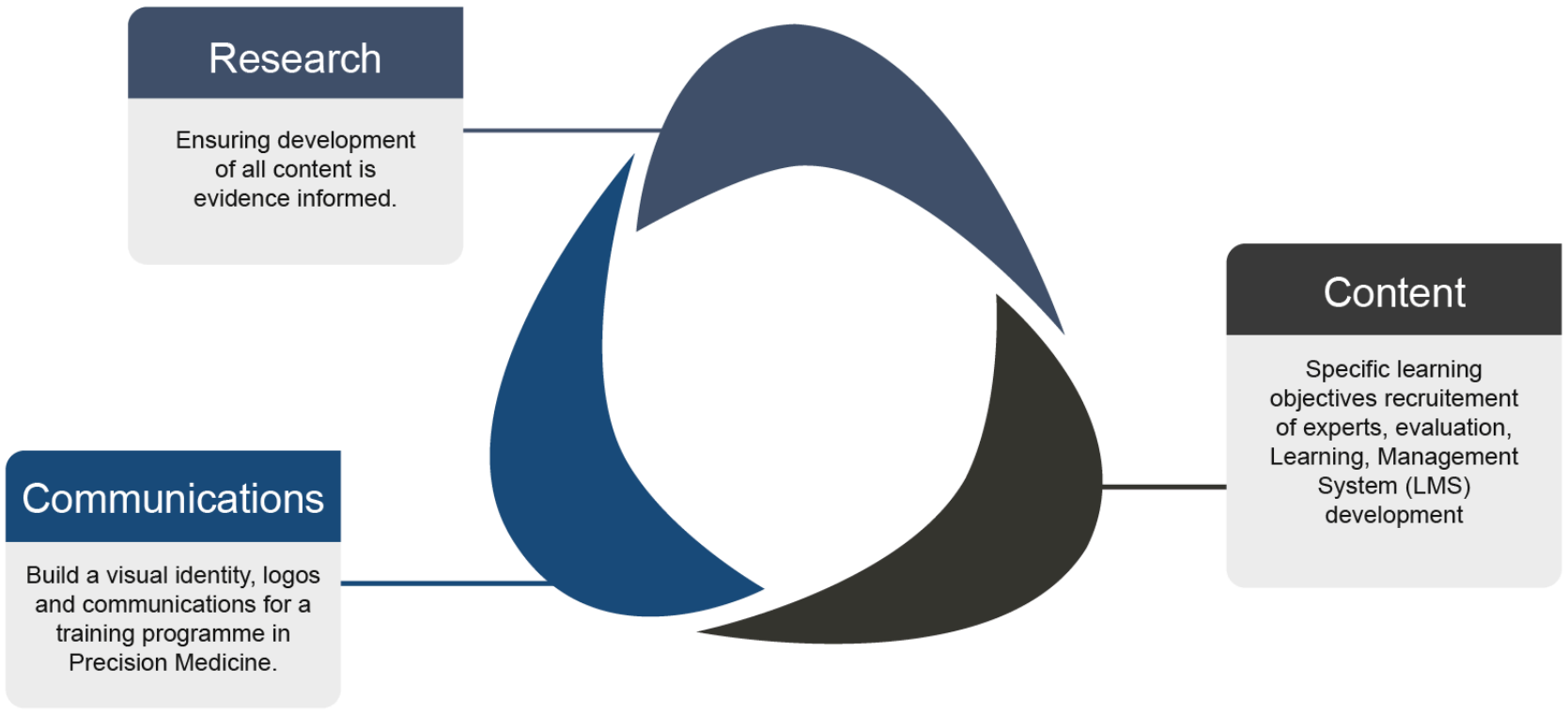

Figure 1: Strategic focus areas

Module 1
Introduction to Precision Medicine (English)

Module 2
Shared Decision Making for Precision Medicine (French/ German)

Module 3
Genomic Testing (English)

Module 4
Precision Medicine in Primary Care (English)

Module 5
Pharmacogenetics for primary care professionals (English)

Financing

We are very grateful to the funder ‘health2030’ for supporting this innovative initiative and supporting Frontliners for the duration of the time needed to reach our intended aims.

FOCUS AREA 1 – content development of a state-of-the-art training programme

The module topics are carefully selected and informed from the targeted needs assessment research study. Each module is built upon the foundations of learning theory, conceptual frameworks, and evidence-informed education. https://frontliners.openolat.com/dmz/
The production of educational content requires sound educational design based on evidence. The approach taken by the project team to deliver quality education for the first release has required a step-by-step approach to curriculum design including Needs assessment – Content development – Organisation and implementation – Monitoring and Evaluation [1, 2].

1. Prideaux D: Curriculum design. Bmj 2003, 326(7383):268-270.
2. Thomas PA, Kern DE, Hughes MT, Chen BY: Curriculum development for medical education: a six-step approach: JHU Press; 2016.

FOCUS AREA 2 – evidence-based education for evidence-based practice

This project applies a scientific empirical approach for education needs assessment to design, plan and implement a blended learning programme to deliver Precision Medicine, to frontline healthcare professionals. The accompanying research track with a PhD in Medical Education investigated learning needs, applied teaching and learning and effectiveness of an online intervention in acquiring new knowledge and skills, key theoretical and applied research issues. This research protocol has enriched and strengthened the developed product.

FOCUS AREA 3 – communication, dissemination and research output

Central to the development of FRONTLINERS is the aim to meet the needs of the target group, and to tailor the communication and a dissemination strategy accordingly. Through the dissemination of the Platform, we will rely on easy access to the online resources, for learner as well as for trainers. Various dissemination processes are to be implemented. The evidence-based principles and new insights will be made accessible through publications, conference presentations and outreach activities.

Key Deliverables

1. Content development of a state-of-the-art training programme

The Institute for Medical Education (IML) is hosting the platform and responsible for the management of access and maintenance of current and future users. The platform is hosted on the LMS Open Olat and have been organised and presented within an easy to use, digital, self-paced learning environment. Learners with access to the platform will have the possibility to progress through their learning independently, with opportunity to reflect on their learning, complete assessments of their learning and receive feedback.

Each learning module includes interactive learning experiences including;

- Didactically presented content on the specific topic.
- Patient case videos
- Illustrations
- Assessment items and feedback opportunities
- Learning tasks

2. Evidence-based education for evidence-based practice

While the key focus area has been development for online modules in Precision Medicine, the team has also successfully implemented this material with face-to-face learning with online courses modules in a blended learning approach. We regard the blended learning approach to be an optimal way to learning, it build on a combination of the online modules and onsite training to facilitate learners acquisition of new knowledge and skills. The possibility to balance online learning with onsite practice (Figure 3), is an asset of this production.

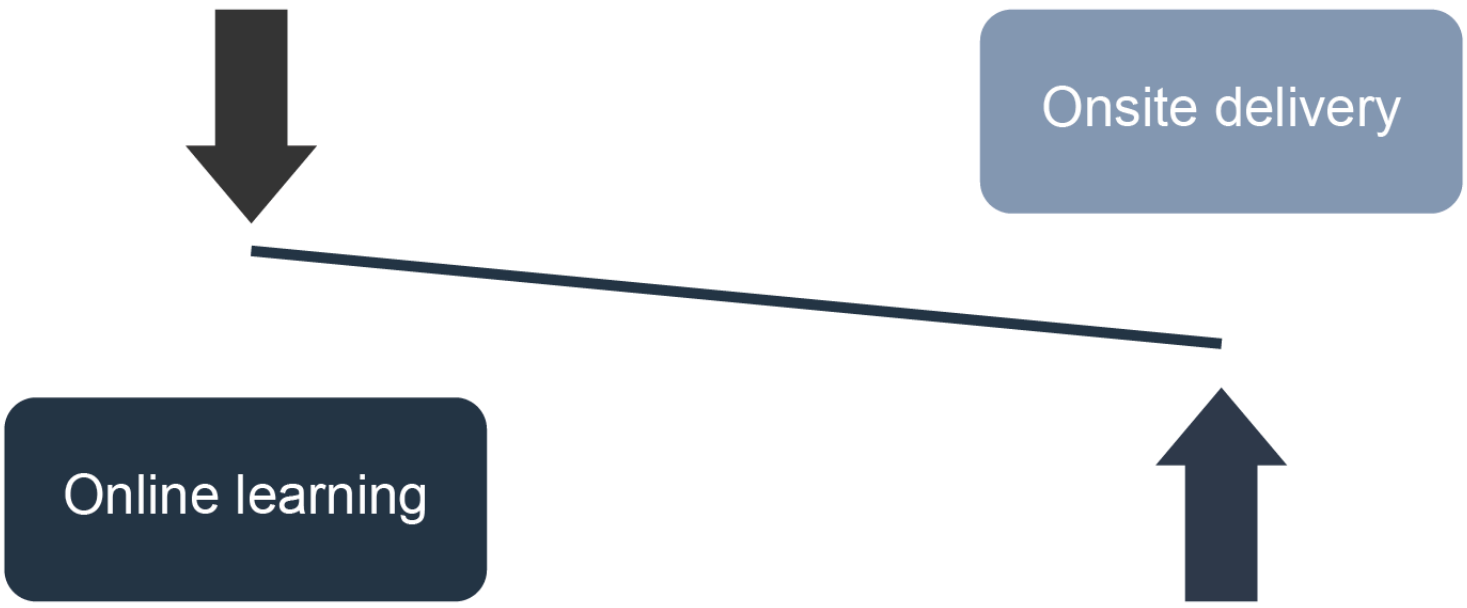

Figure 3: Balancing online learning with onsite delivery

3. Knowledge dissemination, research and outreach activities

This project intended to apply an evidence-based approach for education from the start. This implies that decisions for implementation and development are based on proven didactic principles, and newest insights for online learning design. All the steps are accompanied with applied research, when needs for clarifications have been identified. By way of example, we identified that a needs assessment for this development was necessary. This has been implemented in two sub-studies reported below. Further, it is important to thoroughly test the effectiveness of the learning activities with the online platform, which also resulted in a study. Further studies, relevant in this context are reported below.

PhD Thesis

- Keyfindings from this project was driven and collated in the PhD Project of Sharon Mitchell, which was successfully finalised in 2024.
- The PhD Thesis is entitled «Elevating the design of continuing professional development for the healthcare workforce: An evidence-based example using precision medicine», and can be retrieved by contacting the author or the IML.

Journal articles:

- Mitchell, S., Evrim , J., Schmitz, F. M., Von Kanel, E., Collombet, P., Cornuz, J., Weber, G., Guessous, I., Guttormsen, S. (2022). Investigating acceptability of a training programme in Precision Medicine for frontline healthcare professionals: A mixed Method study. BMC Medical Education (2022,

22:556). https://doi.org/10.1186/s12909-022-03613-2

- Mitchell S, Sehlbach C, Franssen GHL, Janczukowicz J, Guttormsen S. (2024) Taxonomy of teaching methods and their use in health professions education: a scoping review protocol BMJ Open 2024;14:e077282. doi: 10.1136/bmjopen-2023-077282

- Mitchell, S., Jaccard, E., Cardineaux, R., Collombet, P., Cornuz, J., Waeber, G., Guessous, I., Guttormsen, S. (2020), Implementing an Online Training Programme in Precision Medicine for Primary Care Professionals: a Multi-Method Approach. Short paper in the Proceedings of 17th IADIS international conference on Cognition and Exploratory Learning in Digital Age (CELDA), 18. – 20.11.2020, Lisbon, Portugal.

- Mitchell, S, Schmitz, F.M, Pless, A., Guessous, I., Guttormsen, S. (submitted). Exposing the knowledge gap in precision medicine among primary care professionals: results of a survey study.

- Mitchell, S, Schmitz, F.M, Buzzi, Guessous, I., Guttormsen, S. (submitted). A new online module on genomic testing improves students' and general practitioners' skills performance in simulated patient encounters: Results from a Pre-test post-test trial.

- Sharon Mitchell, Evrim Jaccard, Felix Schmitz, Jolanda Elmers, Gérard Waeber, Idris Guessous, Sissel Guttormsen (in preparation). Effectiveness of educational interventions on genetics / genomics for primary care professionals. A systematic Review.

Outreach and conference contributions

- Mitchell, S., Schmitz F., Guessous, I. ,Janczukowicz J.,Guttormsen S. (2024)
  Learning effects of an online learning intervention for skills acquisition using simulated patient encounters: a controled field study. Short presentation at AMEE Basel Switzerland, 24 – 28 August 2024.

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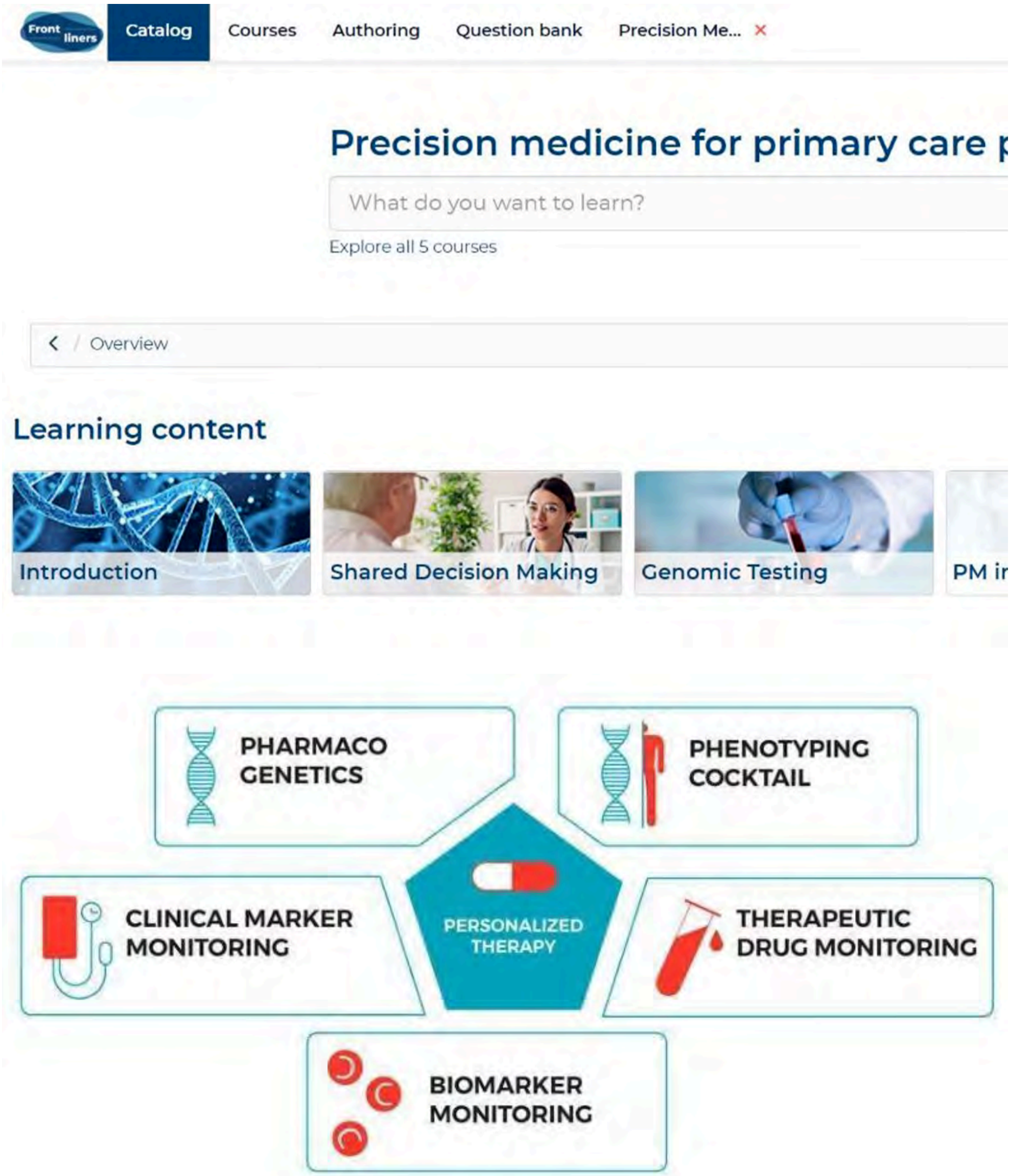
Project Team

The interdisciplinary approach within this project has been a key to success. The principle of the development was the seamless cooperation between content experts, medical educators, infrastructure experts and management. To deliver such a project with the intended high quality, and fit for purpose, is indeed a grand project.

Executive board
Prof. Dr. med. Idris Guessos, Geneva University Hospitals, UNIGE (Co-IP)
Prof. Dr. phil. Sissel Guttormsen, IML, medical faculty, University of Bern (Co-IP)
Prof. Dr. med. Jacques Cornuz, Unisanté/UNIL (Co-Applicant)
Prof. Dr. Dr. med. Gérard Waeber, CHUV/UNIL (Co-Applicant)

Team IML, focus medical education
Sharon Mitchell (PhD Candidate), Felix Schmitz (Scientific collaborator), Daniela Schmid (Web Design), Sissel Guttormsen (Co-Project head, PhD Supervisor)


Front liners
Catalog
Courses
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Question bank
Precision Me...
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What do you want to learn?
Explore all 5 courses
Overview
Learning content
Introduction
Shared Decision Making
Genomic Testing
PM ir
PHARMACO GENETICS
PHENOTYPING COCKTAIL
CLINICAL MARKER MONITORING
PERSONALIZED THERAPY
THERAPEUTIC DRUG MONITORING
BIOMARKER MONITORING

Front liners

Teaching precision medicine to primary care professionals

Project information

Short project description

Project website

FRONTLINERS online learning platform

Teaching precision medicine to primary care professionals

This new learning platform offers multiple online modules designed for primary care professionals including physicians, pharmacists and nurses. We aim to support access to information and evidence based information about precision medicine, tailored for frontline healthcare professions. The objective is to offer them the knowledge and basic skills to apply a more precision medicine approach in daily practice and to support them in providing their patients with high quality information, advice and care.

IML Institute for Medical Education

u b UNIVERSITY OF BERN

FRONTLINERS-Flyer

Download PDF

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Doktorandin

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Contact

We hope to meet your interest with this project.

If you are interested in a cooperation and / or to use the platform, please contact Sharon Mitchell: sharon.mitchell@unibe.ch

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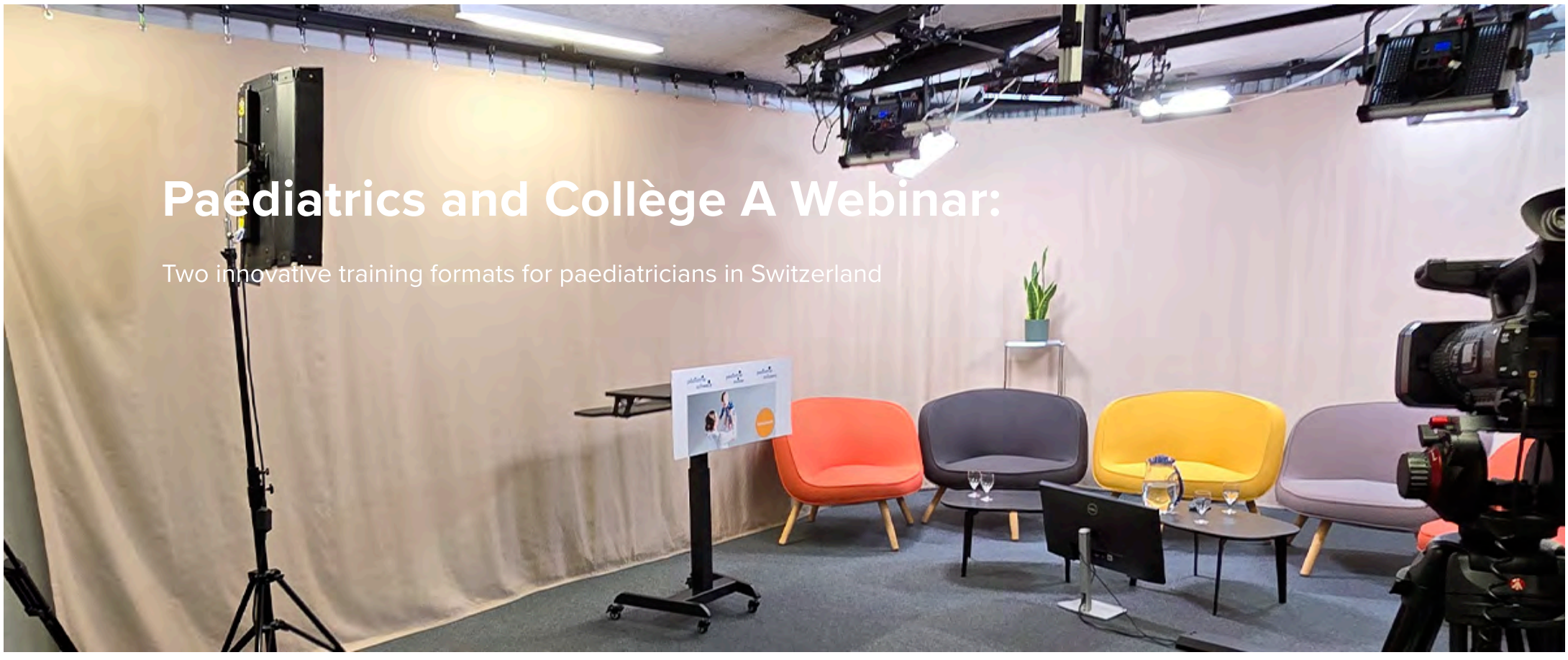

Paediatrics and Collège A Webinar:

Two innovative training formats for paediatricians in Switzerland

Text: Dr. med. et MME Nick Lüthi, 07.04.2025

2024 2025 Service Event

Continuous training is essential for paediatricians in order to keep up to date with the latest knowledge. In Switzerland, two formats are available for this purpose: the **Paediatrics Webinar and Collège A**. Both formats offer unique advantages, to deepen specialist knowledge and promote exchange within the specialist community and are organised in collaboration with the **specialist society in paediatrics and adolescent medicine** 'paediatrics switzerland' with the Department for Education and Media (AUM) of the Institute for Medical Education (IML).

1. Webinar Paediatrics - flexible, interactive and location-independent

The **Paediatrics Webinar** has established itself as a modern, contemporary format that meets the needs of paediatricians. With **5 to 6 online events per year**, a wide range of topics is covered, which is orientated towards the content of the print edition of the specialist journal Paediatrica. This ensures that the topics covered are highly relevant. Around 200 people register online for each event.

The format follows a clear sequence: After a brief introduction by a representative of the 'paediatrics switzerland' board, there are usually **2 to 4 keynote speeches** given by recognised experts in their field. This is followed by a plenary discussion in which all participants - both those present on site and the experts who have joined in - have the opportunity to **ask questions directly to the speakers**. This interactivity is one of the main advantages of the format, as it promotes dialogue and strengthens the transfer of knowledge.

Another plus point is the **flexibility of location**. As the webinar takes place via **Zoom** there is no need to travel. The events take place over **lunchtime**, which has minimal impact on the participants' working day. Participation entitles individuals to receive **credit points (CME)** - an additional incentive that promotes continuous further training - which are awarded by the specialist association. The consistently high number of participants and the spontaneous feedback from participants show that the webinar meets their needs.

Figure 1: Set-up in the video studio in the AUM

2. Collège A - face-to-face courses with intensive exchange

The **Collège A** using MS Teams differs from the Zoom webinar in its format, functioning as a synchronously broadcasted lecture to various other lecture halls. From alternating venues, every year around **10 events** are streamed to other institutions. An unlimited number of participants in the different lecture halls can benefit from this stream. This regional distribution enables paediatricians from all over Switzerland to participate. The other institutions are each connected in a lecture theatre. The events are administered, recorded and post-processed by the AUM and are permanently available via the **specialist society's e-learning portal in paediatrics and adolescent medicine.**

While the webinar covers several topics, Collège A is usually dedicated to **one central topic per event**. This allows for a more intensive discussion of the topic. Participants benefit from personal interaction, both with the speakers and with colleagues on site. This opportunity to network is a key advantage of Collège A, which is often only available to a limited extent at virtual events.

By focussing on a specific topic and being present on site, a **deeper transfer of knowledge** is achieved. This promotes intensive dialogue and creates an ideal basis for anchoring the content in the long term.

Figure 2: Technical installation of the IML video studio

Conclusion

The **Paediatrics Webinar** and **Collège A** are two complementary training formats that cater to different needs. While the webinar impresses with its flexibility, interactivity and the option to participate from anywhere, Collège A offers an in-depth examination of a specific topic as well as the opportunity to maintain a direct exchange

both on site and via chat. Both formats enrich paediatric training and make a valuable contribution to the continuous development of paediatricians' specialist skills in Switzerland. The feedback from participants at both events was consistently positive.

Dr. med. et MME Nick Lüthi
Team leader of learning media

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IT-Monitoring mit «Freier Software»

Das IML setzt viele verschiedene «Freie Software» für die Serverinfrastruktur (ca. 250 Systeme) ein: Betriebssysteme, Programmiersprachen und Bibliotheken, Applikationen, Webdienste, Datenbanken und ganze Anwendungen. Am konkreten Beispiel des IT-Monitorings wird der Einsatz von «Freier Software» exemplarisch beleuchtet.

Text: Axel Hahn, 01.07.2025

2024 2025 Development

«Freie Software» (Freiheiten gewährende Software, free software) bietet eine Vielzahl von Vorteilen, darunter die Möglichkeit, den Quellcode zu überprüfen, anzupassen und zu verbessern. Dadurch haben Nutzende mehr Kontrolle über ihre Software und können diese ihren individuellen Bedürfnissen anpassen. Wie also funktioniert es?

Freie Software stellt die Freiheit von Computernutzern in den Mittelpunkt. Ein Nutzer erhält mit dem Empfang der Software die vollumfänglichen Nutzungsrechte und diese dürfen ihm nicht vorenthalten oder beschränkt werden. Per Lizenz werden folgende 4 Freiheiten eingeräumt:

- Die Freiheit, das Programm nach eigenem Gutdünken und zu jedem beliebigen Zweck auszuführen (Freiheit 0).
- Die Freiheit, die Funktionsweise des Programms zu studieren und so zu ändern, dass es die gewünschten Aktionen durchführt (Freiheit 1). Der Zugang zum Quellcode ist eine Voraussetzung dafür.
- Die Freiheit, Kopien weiterzugeben (Freiheit 2).
- Die Freiheit, Kopien der veränderten Versionen an andere weiterzugeben (Freiheit 3).

Diese 4 Freiheiten grenzen Freie Software von anderen Lizenmodellen wie z.B. Open source, Freeware oder kommerzieller Software klar ab.

Der Begriff «freie Software» wurde von der 1985 gegründeten Free Software Fondation (FSF) geprägt, einer gemeinnützigen Organisation, die sich für die Förderung von Softwarefreiheit einsetzt. Die FSF publiziert die GNU General Public License (GNU GPL), die weltweit populärste Lizenz für Freie Software. Die GNU GPL ist rechtlich weltweit wirksam und lässt sich bei Verstössen vor Gericht durchsetzen.

Freie Software ist in der Industrie seit vielen Jahren etabliert. Grosse Player, wie z.B. Microsoft, die kommerzielle Produkte und Services anbieten, profitieren von Freier Software. Neben ihren kommerziellen Produkten stellen sie frei verwendbare Produkte zur Verfügung und engagieren sich für die Weiterentwicklung Freier Software. Freie Software kann in der Regel als sicher angesehen werden, da sie von einer grossen Gemeinschaft von Entwicklern überprüft und verbessert wird. Da der Quellcode offen ist, können Sicherheitslücken schneller entdeckt und behoben werden. Allerdings hängt die Sicherheit auch von der jeweiligen Implementierung und

Wartung ab. Freie Software kann sicher sein, solange sie von vertrauenswürdigen Quellen heruntergeladen und regelmässig aktualisiert wird, um Sicherheitslücken zu schliessen. Auch zur **Kosteneinsparung** gibt es Studien. »Unternehmen müssten laut der Analyse ohne freie Software 3,5-mal so viel für ihre Computerprogramme ausgeben, als sie es derzeit tun. 84 Prozent der Mehrkosten würden allein für die sechs wichtigsten Programmiersprachen anfallen.»

Aber wenden wir nun den Blick auf das IML.

Server- und Service-Monitoring am IML

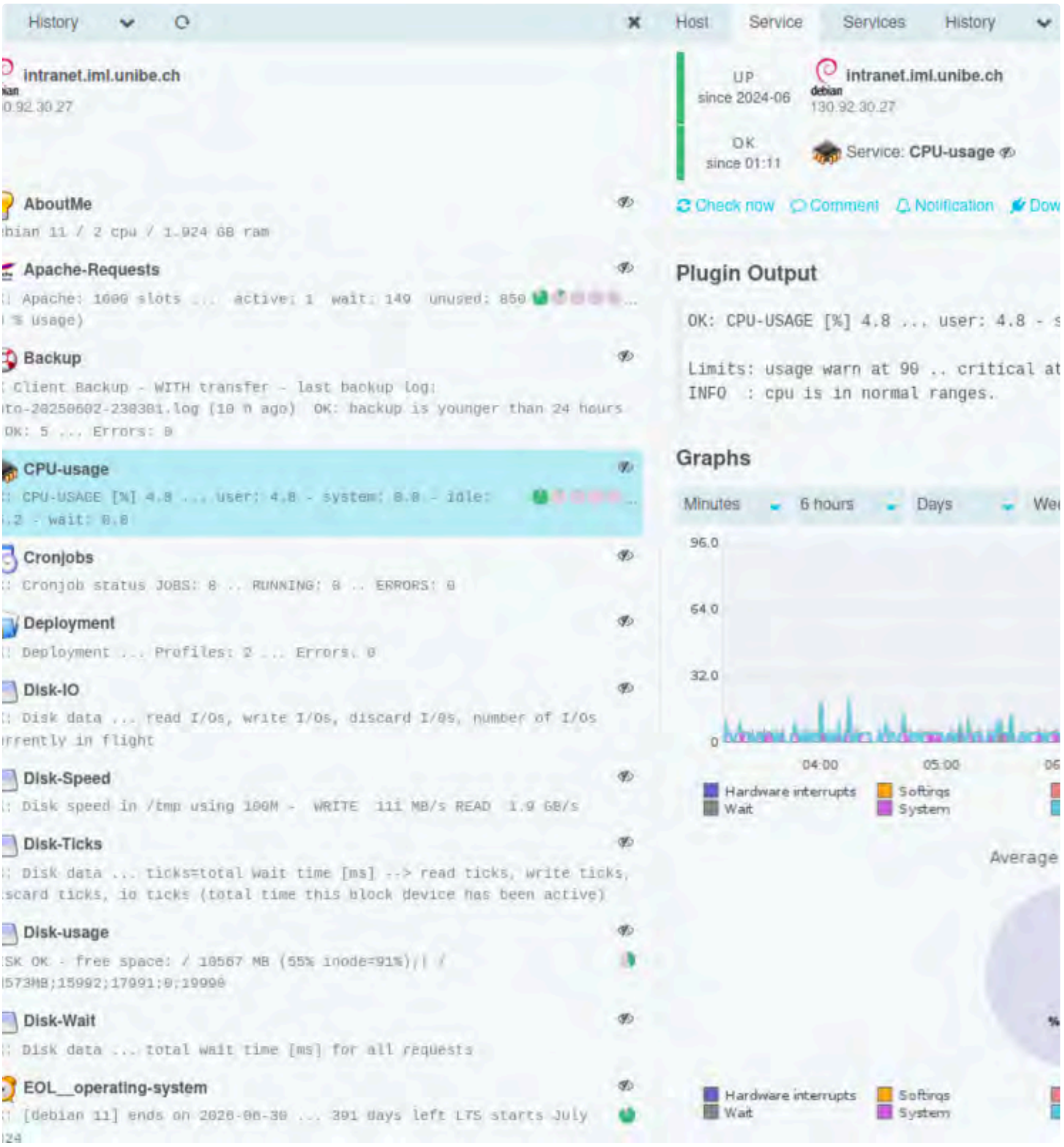
Wenn man ein Netzwerk mit Rechnern und anderen Geräten an mehreren Standorten betreibt, möchte man als Administrator den Überblick behalten, ob alles in Ordnung ist oder Handlungsbedarf wegen eines in absehbarer Zukunft auftretenden Engpasses oder gar eines Ausfalls einer Komponente besteht. Für eine Gesamtübersicht über alle Systeme setzt das IML Monitoring-Werkzeuge ein.

Teillbereiche unseres IT-Monitorings

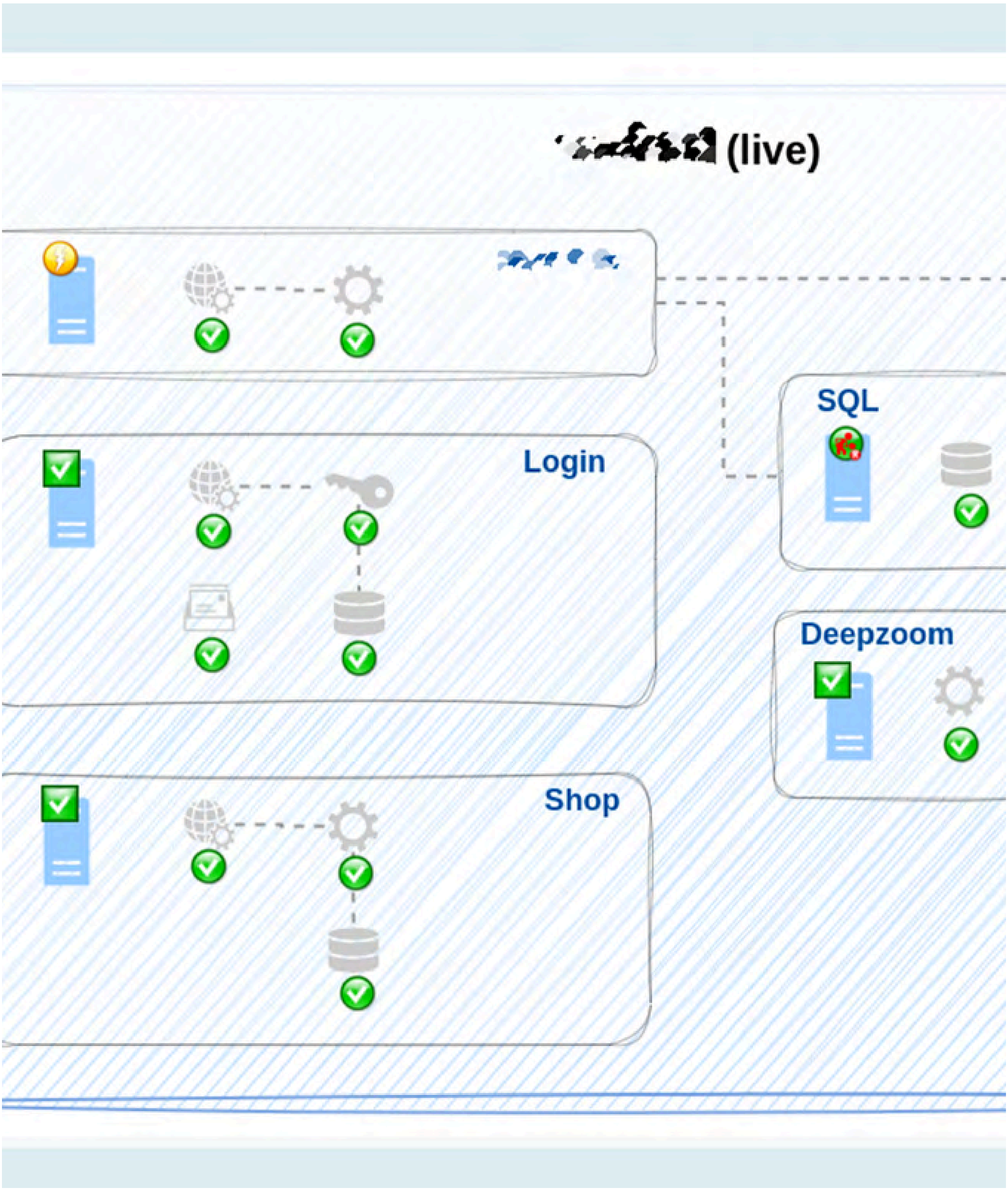
System-Monitoring

Betreibt man verschiedene Geräte und Server und möchte die Verfügbarkeit einzelner Hardwarekomponenten, Kennwerte oder laufende Programme im Blick behalten, so setzt man ein System-Monitoring ein. Wir verwenden bei uns im Haus die Freie Software Icinga2.

Damit ein Monitoring-Werkzeug den Gesamtzustand mitsamt aller Details anzeigen kann, müssen die Informationen zunächst mit Hilfe von Checks (in anderen Produkten auch Sensoren genannt) gesammelt und zugestellt werden. Wir verwenden nicht nur die Checks des Herstellers auf unseren Systemen – dank der Offenlegung des Formats können Drittanbieter das Repertoire erweitern und man kann diese auch selbst programmieren. Vom IML sind ca. 50 Checks unter GNU GPL 3 publiziert worden.



Detailseite eines Einzelsystems kann man die Ergebnisse der Checks einsehen. Viele Checks bieten Graphen mi



oniert Checks verschiedener Systeme auf einer Grafik oder Karte. Damit kann man eine Visualisierung für eine A

Wir sind zufrieden mit dem Produkt Icinga2, was es kann, dessen Erweiterbarkeit und wie wir es handhaben können. Es gibt keine lizenzbedingten Beschränkungen bezüglich Anzahl zu überwachender Systeme oder pro System durchgeführte Checks.

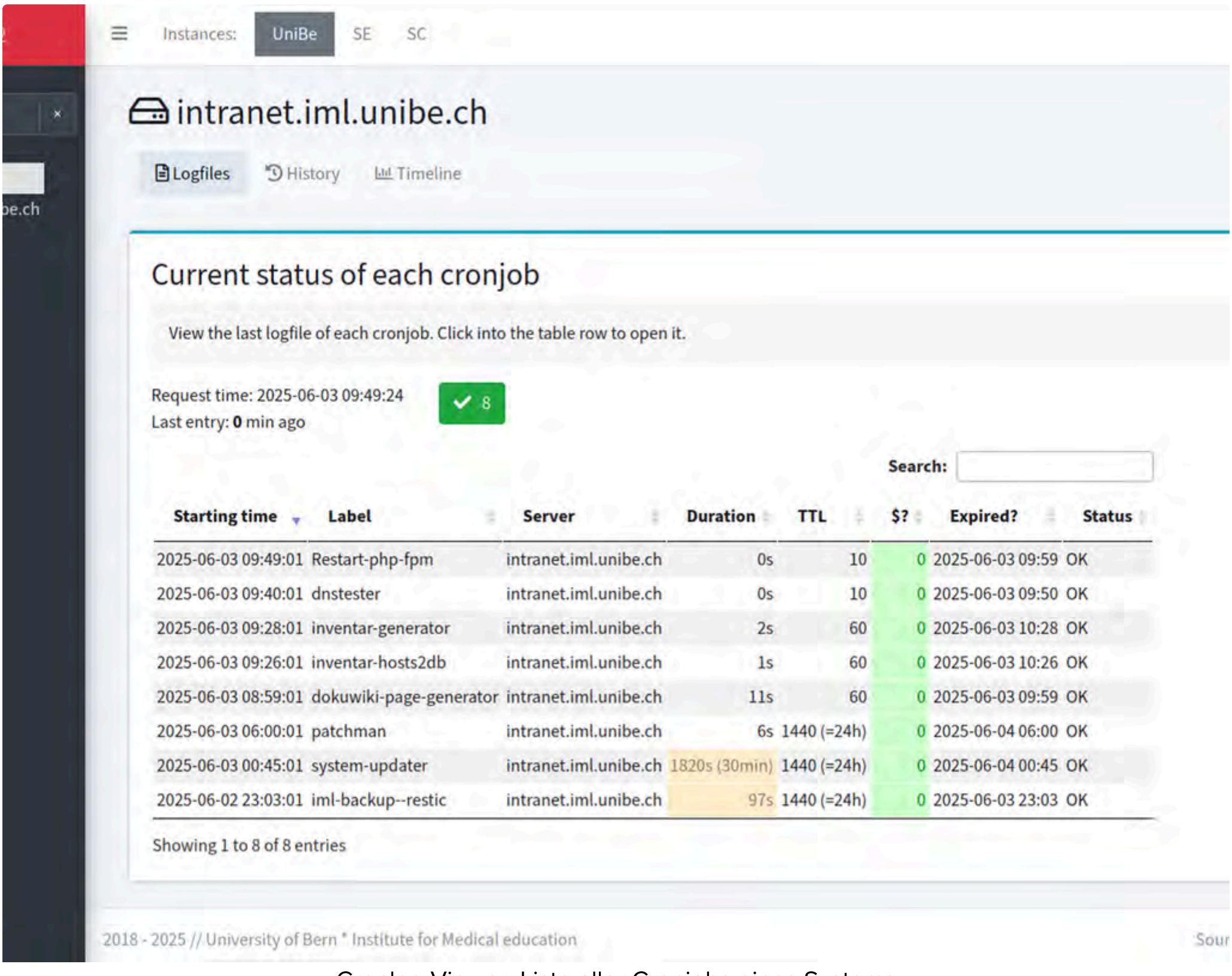
Der Hersteller ist aktiv an der Weiterentwicklung und Behebung von Sicherheitslecks. Es gibt eine breite Community. Zusammen mit der Icinga GmbH entstand 2023 eine Success-Story zur Einführung ihres Produkts:

Im Juni 2024 fand die Icinga Summit statt, wo der Hersteller die aktuellen Entwicklungen und Pläne zeigte. Axel Hahn hielt einen Vortrag zum Aufbau der Icinga-Infrastruktur am IML. Die Veranstaltung war ein guter Ort, um sich mit Gleichgesinnten auszutauschen und sich andere Implementierungen, Lösungskonzepte und Eisatzmöglichkeiten anzusehen.

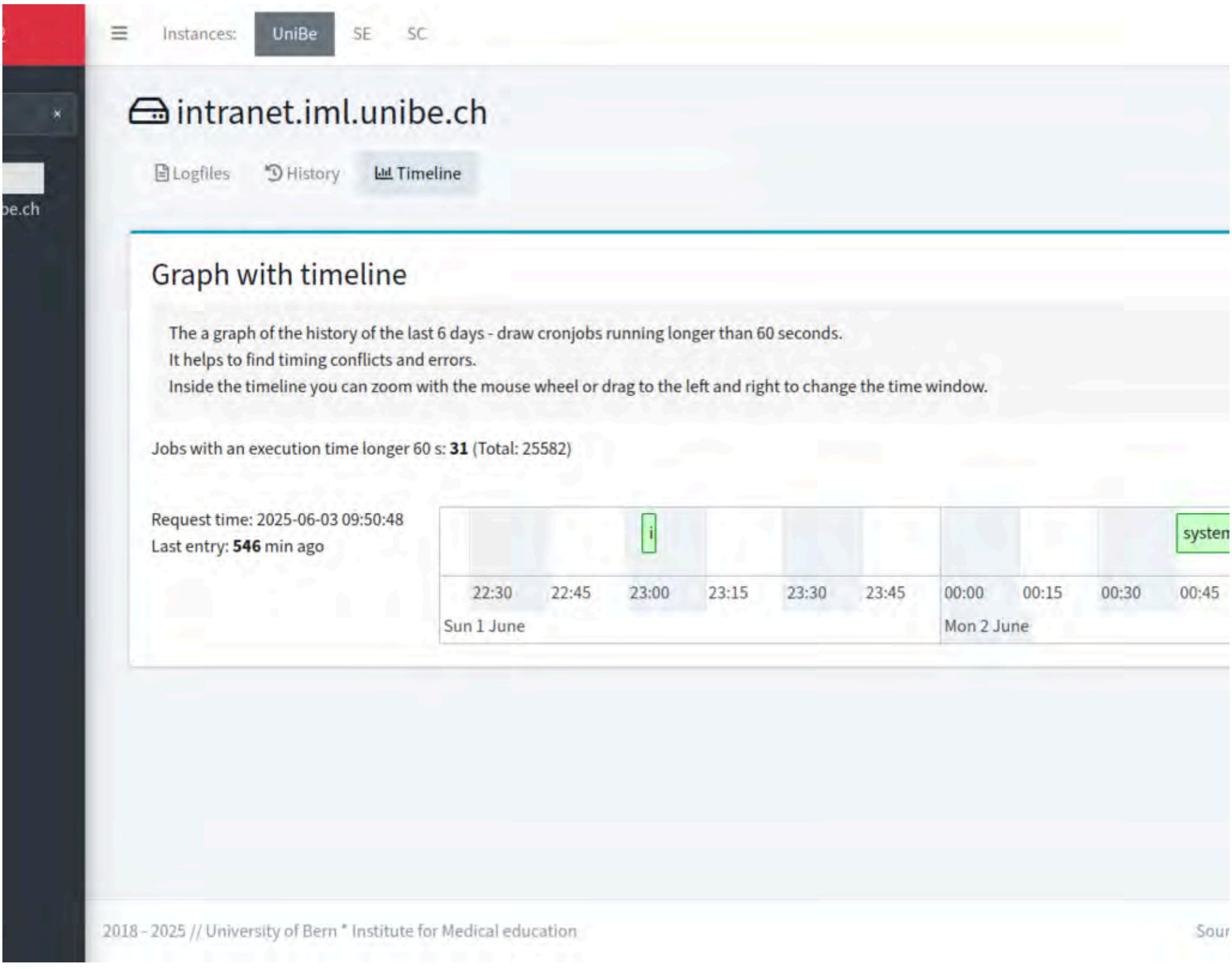
Mit Hilfe eines zentralen Logservers werden Protokolldaten verschiedener Dienste von allen Systemen zentral eingesammelt. Für diesen Typ des Monitorings haben wir keine Eigenentwicklungen - wir setzen fertige Produkte ein.

Cronjobs

Cronjobs sind regelmässig ausgeführte Aufgaben, sei es alle N Minuten, täglich/ wöchentlich/monatlich zu einer festgelegten Zeit. Um eine Überwachungsmöglichkeit zu eröffnen, wird mit dem Cronwrapper ein kleines Zusatz-Werkzeug eingesetzt. Der Ausführungszustand wird in Kurzform in Icinga angezeigt. Zur Ansicht von Details werden die Logdaten inklusive Textausgabe oder Ausführungszeit aller Cronjobs für eine zentrale Ansicht zusammengeführt. Per Weboberfläche kann man bequem alle Server und ihre Cronjobs detailliert einsehen. Der «IML Cronlog Viewer» ist als Freie Software unter GNU GPL 3 publiziert.



Cronlog Viewer: Liste aller Cronjobs eines Systems



Cronlog Viewer: Timeline mit benötigen Laufzeiten der Jobs

Applikations-Monitoring

Das Icinga-System-Monitoring gibt Kennwerte und Zustände zu einzelnen Geräten oder Systemen an. Sind alle Systemkennwerte in Ordnung, so ist dies nicht implizit die Aussage, dass auch eine bestimmte Applikation funktioniert. Aber auch die umgekehrte Aussage kann zutreffen: wenn zu einem System ein Check einen kritischen Zustand aufweist, so kann eine Applikation dennoch vollständig funktional sein. Daher ist ein ergänzendes Applikations-Monitoring sinnvoll.

Mit dem **«IML Appmonitor»** haben wir am Institut seit 2014 eine Client-Server Applikation entwickelt. Der Appmonitor-Server ist eine PHP-Anwendung, die mit minimalen System-Anforderungen betreibbar ist. Privatpersonen können das Produkt bei einem Shared Hosting einsetzen. Der IML Appmonitor ist Freie Software unter GNU GPL 3.

Client

Ein Appmonitor-Client wird auf dem Rechner einer PHP-Anwendung installiert. Er beinhaltet mehrere einzelne Bausteine zum Prüfen des Dateisystems, Netzverbindungen, Datenbank-Verbindungen und einiges mehr. Mit diesen wird die Lauffähigkeit einer Applikation ermittelt. Das funktioniert typischerweise wie folgt:

- Gibt es eine Konfigurationsdatei und kann man diese lesen?

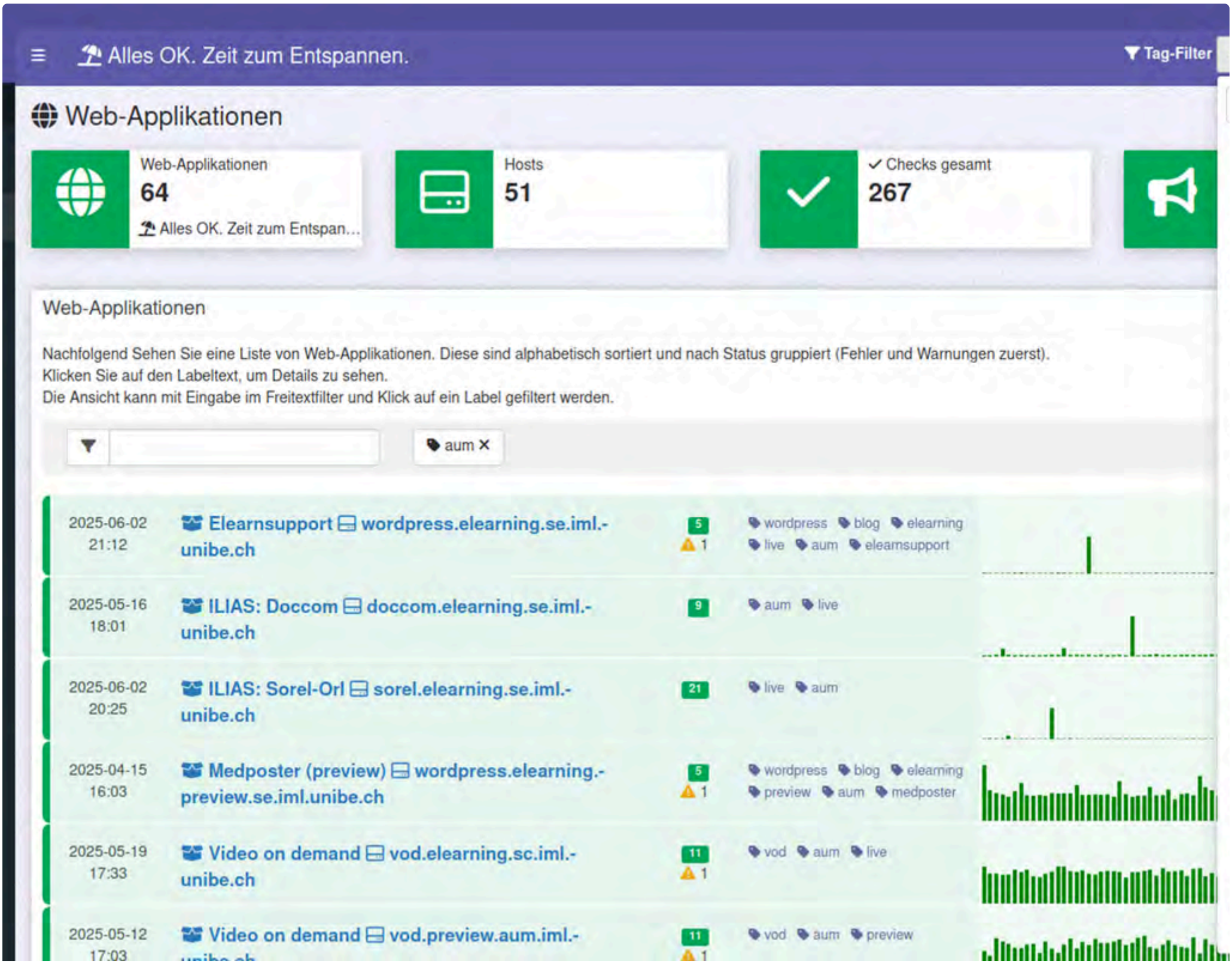
- Können die Datenbank und benötigte Schnittstellen mit den Verbindungsangaben aus der Konfiguration verbunden werden?
- Ist der Upload-Ordner vorhanden und beschreibbar?
- Ist das Webseiten-Zertifikat gültig?
- Auch Negativtests sind sinnvoll: sieht ein Anwender wirklich eine Fehlermeldung, wenn auf einen geschützten Bereich oder sensible Daten zugegriffen wird?

Jeder Test liefert ein Resultat mit Text und Bewertung in Ampelfarben. Daraus wird eine Gesamtbewertung zur Lauffähigkeit einer Anwendung ermittelt. Einige erste Prüfungen bekannter PHP-Anwendungen wurden ebenfalls in den Client übernommen. Damit muss die Zusammenstellung der Prüfungen nicht immer von Grund auf neu geschrieben werden und funktionieren out-of-the-box.

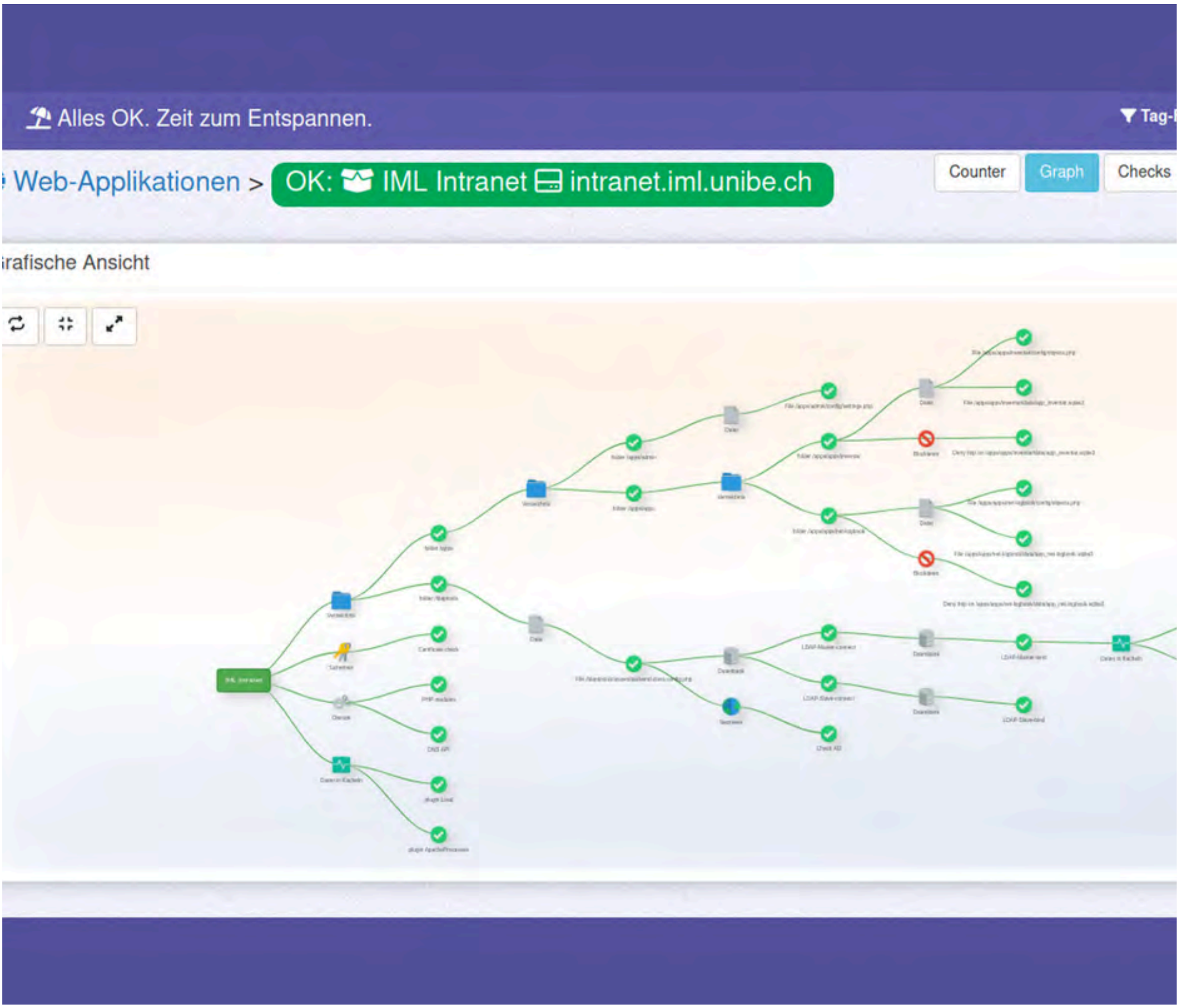
Und bei Anwendungen in anderen Programmiersprachen als PHP? Hier können die Check-Bausteine nicht verwendet werden. Es ist daher die Beschreibung der erwarteten Struktur dokumentiert, damit ein Appmonitor-Client in anderen Programmiersprachen implementiert werden kann. Einen weiteren Ansatz zeigt ein Schwesterprojekt auf: ein Client als ausführbare Datei. Dieser besitzt alle Prüfmöglichkeiten des PHP-Clients und ist unabhängig von einer Programmiersprache. Aber: er muss aber für eine Zielplattform compiliert werden können. Das Projekt hat daher noch eher experimentellen Character.

Server

Der Appmonitor-Server bietet eine Weboberfläche für den internen Gebrauch und zeigt die Übersicht aller eingebundenen Applikationen. Die benötigten Informationen werden von den überwachten Applikationen mit parallelen Https-Anfragen abgeholt. Die Anzeige erfolgt nach Kritikalität: Fehler und Warnungen hat man so als erstes im Blick. Ein Klick auf eine Anwendung zeigt deren Details an. Eine Liste aller aktuellen Probleme und eine Historie der Status-Veränderungen und Filtermöglichkeiten komplettieren die Anzeige. Bei Einschränkungen oder Ausfall einer Anwendung wird der für das betroffene Produkt relevante Benutzerkreis per Email oder Slack informiert.



Appmonitor: Liste der Applikationen



tailansicht einer Applikation - die Baumansicht zeigt die Abhängigkeiten der Checks auf, was bei der Fehleranal

API

Auf den Server ist weiterhin ein abgesicherter, maschinenlesbarer Zugriff möglich. Mit Hilfe einer Schnittstelle (API) kann man Informationen zum Systemzustand des Appmonitors wie auch alle Daten aller überwachten Anwendungen abrufen.

So lässt sich eine komplett eigenständige Monitoring-Ansicht aufbauen. Sämtliche Systeminterna und für Aussenstehende unverständliche Details können darin ausgeblendet werden. Man kann auch nur eine Teilmenge der Applikationen verarbeiten, sei es für eine Gruppe von Anwendungen oder alle Anwendungen einer Abteilung. Derzeit entsteht solch eine vereinfachte Statusanzeige mit reduzierten Details zu Measured-Funktionalitäten auf einem öffentlich zugänglichen System.

Die verwendete PHP-Klasse zum Abfragen der Appmonitor API ist ein weiteres unter GNU GPL 3 publiziertes Schwesterprojekt. Enthalten sind eine einfache Weboberfläche, mit der man starten kann und auch ein API Client zur Verwendung in Skripten.

Fazit

Die Open-Source-Bewegung basiert auf dem Prinzip der Zusammenarbeit und des freien Wissensaustauschs. Sie ermöglicht es Entwicklern, von den Kenntnissen und Fähigkeiten anderer zu profitieren, gemeinsam an Projekten zu arbeiten und kontinuierlich zur Verbesserung der Software beizutragen. An unserem Institut wird Freie Software in grossem Stil eingesetzt. Neben unseren kommerziell orientierten Produkten wird in Teilbereichen des Instituts das Prinzip des Nehmens und Geben gelebt und der Geist der Freien Software unterstützt. Wir profitieren in vielerlei Hinsicht - von freien Betriebssystemen, Anwendungen, Programmiersprachen, Diensten, Entwicklungsumgebungen. Bis hin zu freien Komponenten, die wir in unsere Applikationen einbauen, was uns viel Zeit eingespart hat, da man Teile der Anwendung nicht selbst programmieren, testen und aushärten muss. Einige unserer Eigenentwicklungen stellen wir daher ebenso unter eine freie Lizenz, bieten den Programmcode in öffentlich zugänglichen Repositories an, stellen eine Online-Dokumentation bereit, die Dritten Inbetriebnahme und Nutzung der Software möglich macht.

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