

EYE LEARN : Innovative pedagogical process using eye tracking in acute care simulation

<u>JM. VASSE¹, A. VERDON¹, C. SENN-DUBEY¹, L. ANGELINI², E. MUGELINI², Q. METEIER²</u>

¹ School of Health Science, University of Applied Sciences and Arts Western Switzerland (HES-SO), Fribourg, Switzerland
² HumanTech Institute, University of Applied Sciences and Arts Western Switzerland (HES-SO), Fribourg, Switzerland

Teacher

Hes·so

Haute Ecole Spécialisée de Suisse occidentale Fachhochschule Westschweiz

University of Applied Sciences and Arts Western Switzerland





Technology for Human Wellbeing Institute

INTRODUCTION

- A clinical reasoning using a systematic approach to assess and treat the patient's airway, breathing, circulation, disability and exposure (ABCDE) has been developed at the School of Health Sciences (Verdon & Menoud, 2022).
- In nursing education, simulation is an essential tool to develop clinical reasoning, judgment and decision-making. In this context, **situation awareness** is essential (Endsley, 1995).
- Pedagogical sciences show the importance of developing metacognitive skills to help learners to progress effectively (Leclercq & Poumay, 2004).
- Work on eye tracking shows that **ocular fixations** can be correlated with an integration of observed data (Negi & Mitra, 2020).

METHOD



g Pupil Invisible Glasses



Before the simulation :

Student OBoth

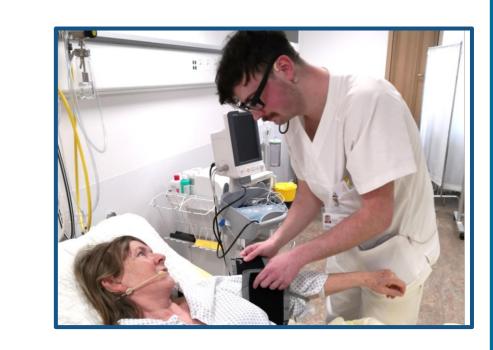
- Several weeks before : Briefing about the new process with eye-tracking glasses.
- On the day of simulation : Equipping the student with the eye tracking glasses + calibration.

During the simulation :

- Students : perform care and clinical reasoning through the ABCDE's systematic approach.
- Teachers : In the video control room, annotating ABCDE phases on interface.
 Data collected = Voice and video from the student's point of view + ocular fixations.

After the simulation :

- **Debriefing** session with the student.
- ---- The student analyses his/her simulation on a second custom interface, with guided
 - metacognition questioning following the timeline below.





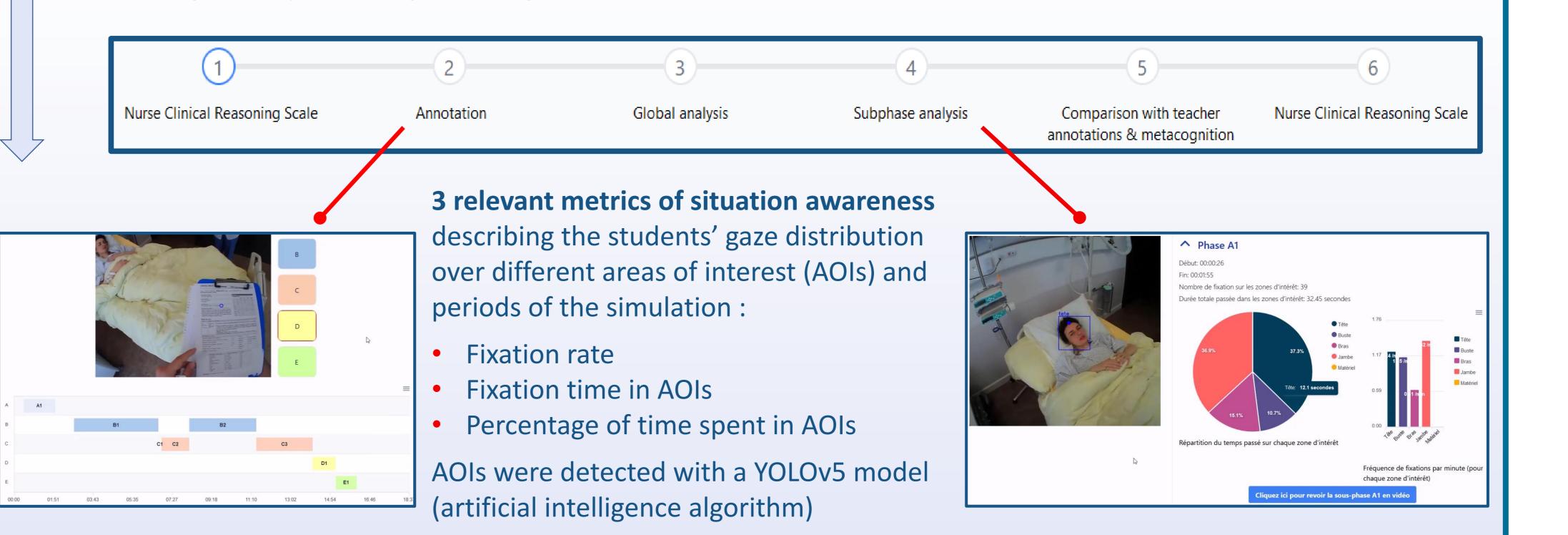
We have developed **EYE LEARN** to help students analyze their simulations, carried out with eyetracking glasses, on an educational platform that supports analysis and reflection.

AIMS

- To improve the application of this **systematic clinical reasoning (ABCDE)** throughout the students' curriculum.
- To enhance students' metacognition.

RESULTS

- 1. Students reported outcomes (5-point Likert scales)
- + User experience/interface:
- Glasses: easy to use (4.72) and non-invasive (4.1).
- Interface (4.1) and instructions/video tutorial (4.86) clear and easy to use.
- + Learning: progress on the elements of clinical care (4.17) and metacognitive reasoning (4.03), added value in training (4.07), positive change for the next intervention (4.34).
- The annotation of the ABCDE approach phases (4). The accuracy of the eye-tracking metrics (3.66).



CONCLUSIONS

- This educational innovation project provides very encouraging initial results.
- Consequently, this procedure was implemented as part of the Bachelor of Nursing training at the School of Health Science in Fribourg.
- Further studies will be led to prove the added value of the EYE LEARN process on students' clinical reasoning and metacognition.
- 2. Students reported outcomes (Short French version of the User Experience Questionnaire)
- Pragmatic quality: 1.72/3, Hedonic quality: 2.32/3, Overall: 2.02/3.
 User experience of the process considered as **excellent** regarding the benchmark set by the authors' questionnaire (Schrepp et al., 2017).
- 3. Teachers Focus Group outcomes
- Easy to use glasses, easy to annotate the ABCDE phases, little impact on the progress of a "standard" simulation, added value for students.
- Adding a task during observation impacts the teacher's mental workload.

- Other specialties or areas of learning have already shown interest in potential transpositions into their training activity in Switzerland or abroad.
- Multidisciplinary collaboration between the School of Health Science and HumanTech in Fribourg is a big value. Progression comes from complementarity.

ACKNOWLEDGEMENT

This work has been funded and supported by the University of Applied Sciences and Arts of Western Switzerland (HES-SO).

Endsley, M. (1995). Toward a Theory of Situation Awareness in Dynamic Systems. Human Factors Journal. Human Factors: The Journal of the Human Factors and Ergonomics Society, 37, 32-64. https://doi.org/10.1518/001872095779049543

Leclercq, D. & Poumay, M. (2004) La métacognition. Méthodes de formation et théories de l'Apprentissage. Editions de l'université de Lièges: Lièges.

Negi, S., & Mitra, R. (2020). Fixation duration and the learning process : An eye tracking study with subtitled videos. Journal of Eye Movement Research, 13(6), 10.16910/jemr.13.6.1. https://doi.org/10.16910/jemr.13.6.1

Schrepp, M., Hinderks, A., & Thomaschewski, J. (2017). Design and Evaluation of a Short Version of the User Experience Questionnaire (UEQ-S). International Journal of Interactive Multimedia and Artificial Intelligence, 4, 103. https://doi.org/10.9781/ijimai.2017.09.001

Verdon, A. & Menoud, G. (2022) La qualité et la sécurité des soins, clé de voûte de l'enseignement : évaluation clinique et démarche de soins dans Krankenpflege = Soins infirmiers = Cure infermieristiche, 2022, 1, 70-71. ISSN: 0253-0465

REFERENCES

CONTACT INFORMATION

Jean-Michel Vasse : jean-michel.vasse@hefr.ch

EYE LEARN : https://www.heds-fr.ch/fr/innovationet-services/eye-learn/





Jean-Michel Vasse



