



Faculté de Psychologie
et des Sciences de l'Éducation



28 October 2024

**Eyetracking-Based Comparative Study of Professional
Vision: University Trainers and Pre-Service Teachers in
Secondary Education**



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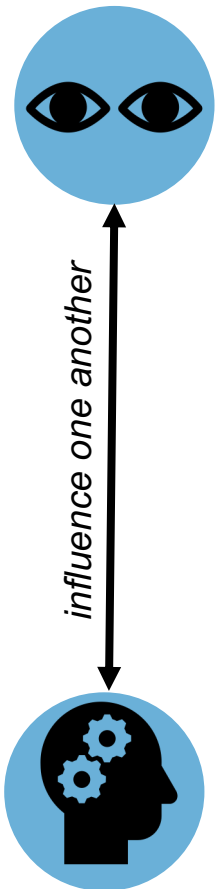
**Tell me what you observe and I'll tell you
who you are.**



Comparative study of professional vision in teaching
using eye tracking, university trainers and future
secondary school teachers.

Professional vision

As Van Es & Sherin (2008)



▪ OBSERVING = TO NOTICE

- Professional competence (Vifquin & Frenay, 2018)
- Teachers' ability to direct their attention to relevant events in the classroom (Sherin, 2007; Van Es & Sherin, 2008)

-> Selective attention is influenced by a series of parameters (Vifquin & Frenay, 2018; Huang et al. 2018) , including expertise (Keskin et al. 2024).

▪ REFLECTING = INTERPRETATION OF OBSERVATIONS

- Based on Van Es & Sherin (2008) and Vifquain & Frenay (2018):
 - 1) Accurate description of the scene (Van Es & Sherin, 2008)
 - 2) Interpretation, judgement and justification (Van Es & Sherin, 2008)
 - 3) Prediction of consequences (Van Es & Sherin, 2008) and remedies (Vifquin & Frenay, 2018)

Statement

- **BASED ON OUR LITERATURE REVIEW (see Duvivier et al. 2024)**
- PV of expert teachers has been studied
- PV of pre-service teachers **(PT)** has already been studied.
- PV of trainers, including academics **(UST)**, is little explored (Duvivier et al. 2024).

Reference authors	University Supervisor Trainer	Pre-service Teacher	Expert Teacher	Novice Teacher
			X	
Yamamoto & Imai-Matsumura (2013)		X	X	
van den Bogert et al. (2014)		X	X	
Wolff et al. (2016)				X
van Leeuwen et al. (2017)		X		
Goldberg et al. (2021)			X	X
Kosel et al. (2021)			X	
Minarikova et al. (2021)		X		
Schnitzler et al. (2020)			X	X
Seidel et al. (2021)		X	X	
Shinoda et al. (2021)			X	X
Stahnke & Blömeke, (2021)		X		
Wyss et al. (2021)	X	X		

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Statement

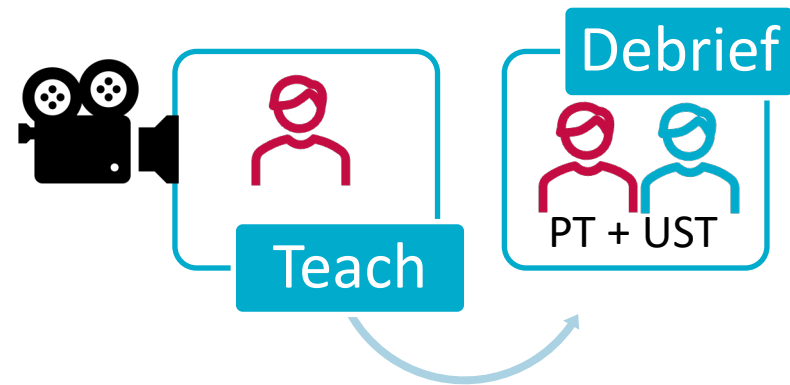
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- > UST practices less opaque in term of PV

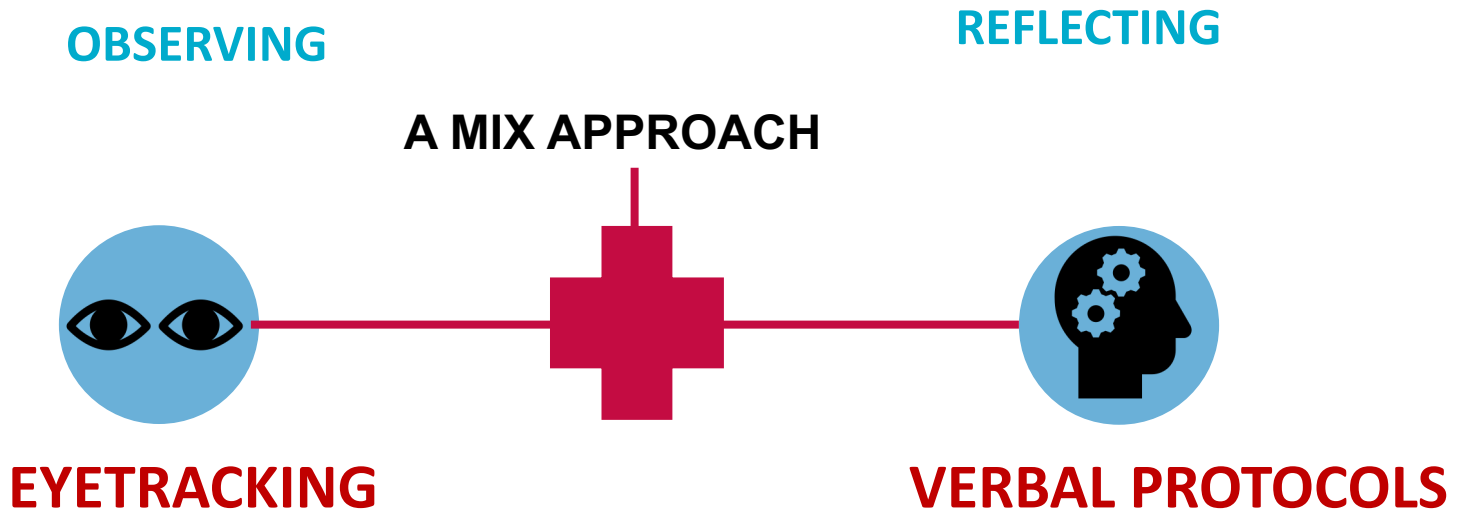


The two participant in question serve the same function.

- view the video
- provide a commentary on it.

Methodology

Eye tracking and TAP

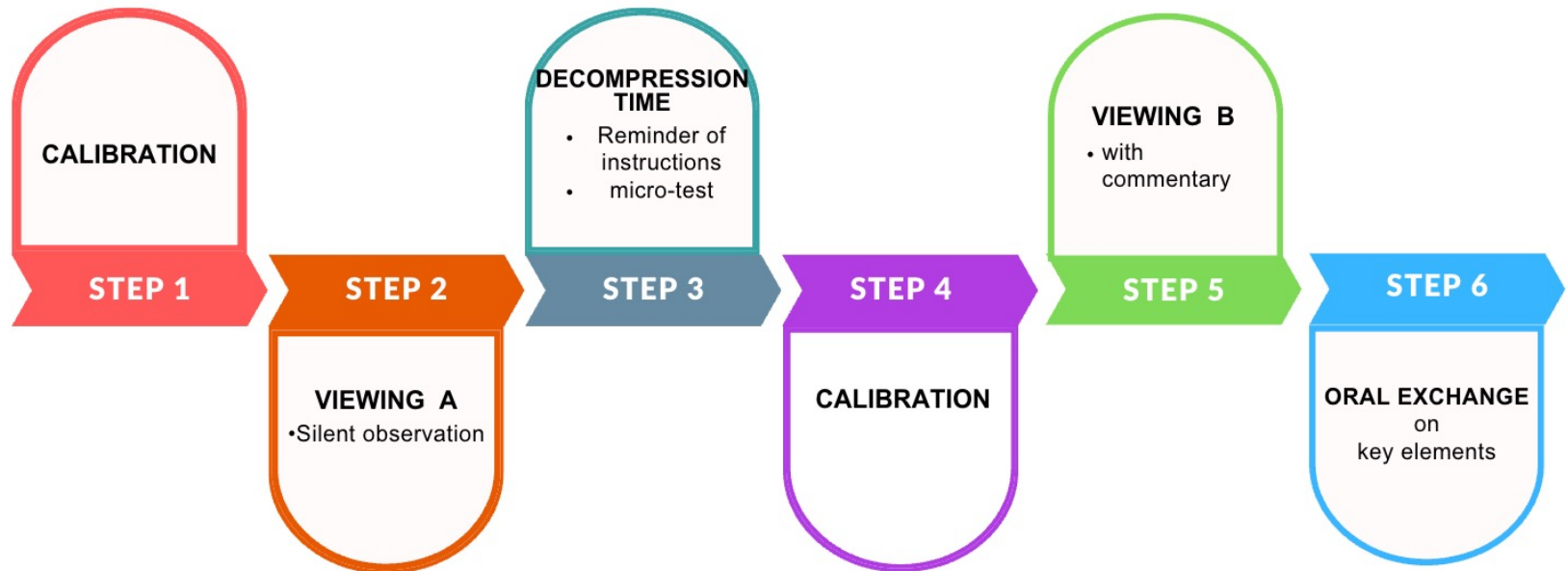
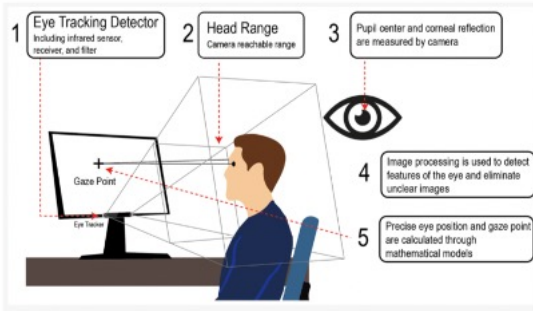


-> Identify the centre of attention by following the eye movements (Wang, 2022) of a teacher observing a teaching situation.

-> Understand the reasons that guided the observation

-> As **Roussel (2017)**: during the observation

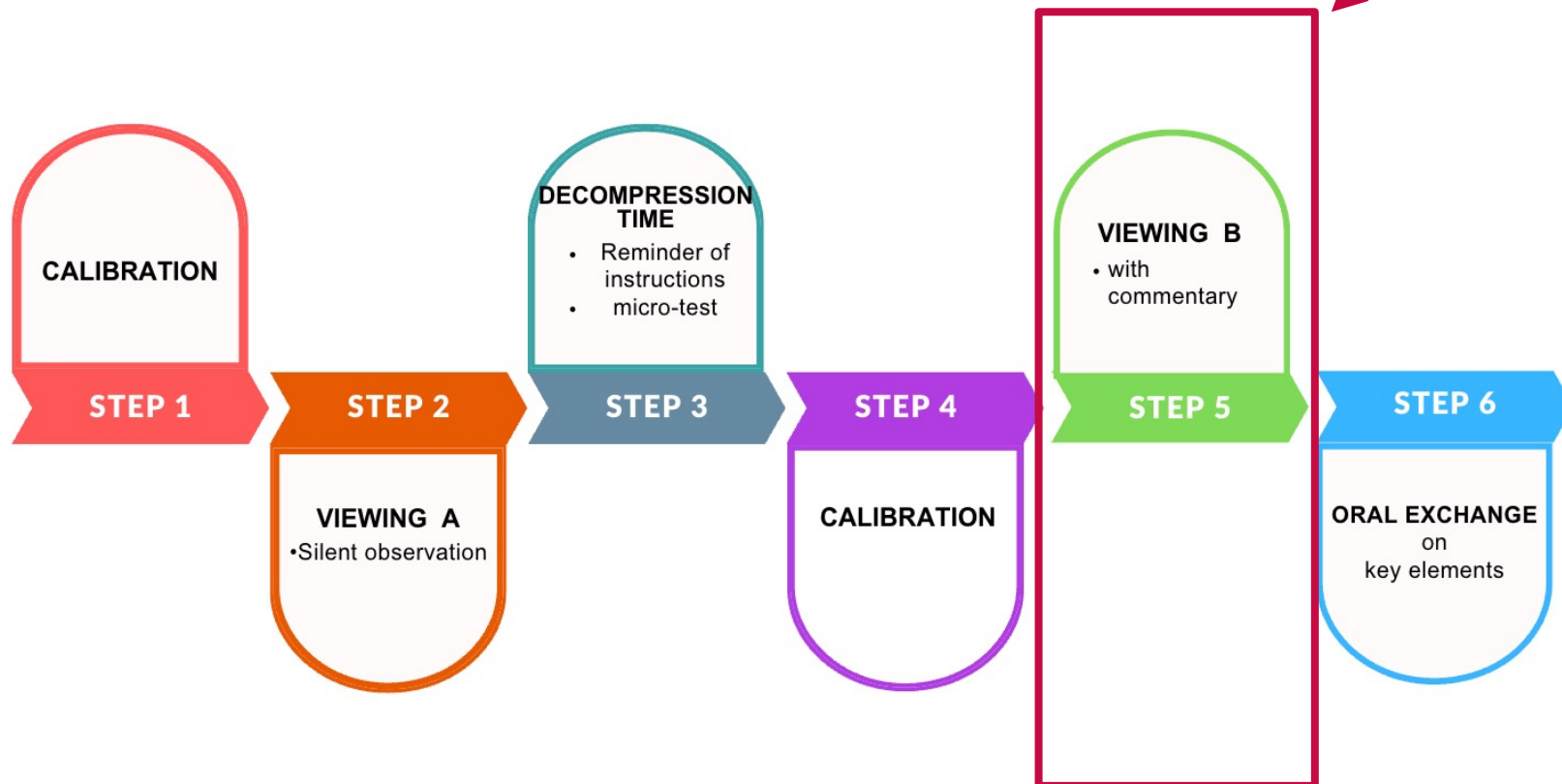
Methodology



*Stages of the experiment
from Duvivier et al. 2024*

Methodology

For this presentation



*Stages of the experiment
from Duvivier et al. 2024*

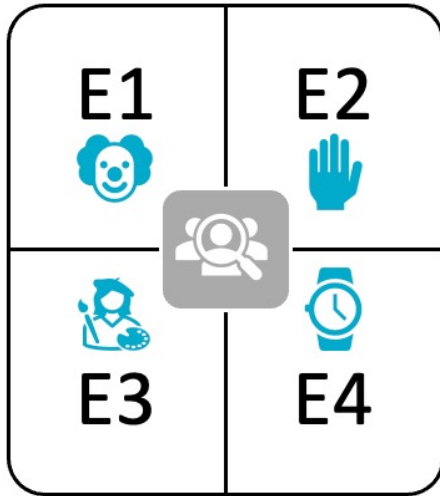
Methodology

The video

- 7 minutes
- A trainee teacher
- Start of a lesson
- The trainee teacher makes a planning error
- Pupil in or off-task



Methodology



Eyetracking
's Data

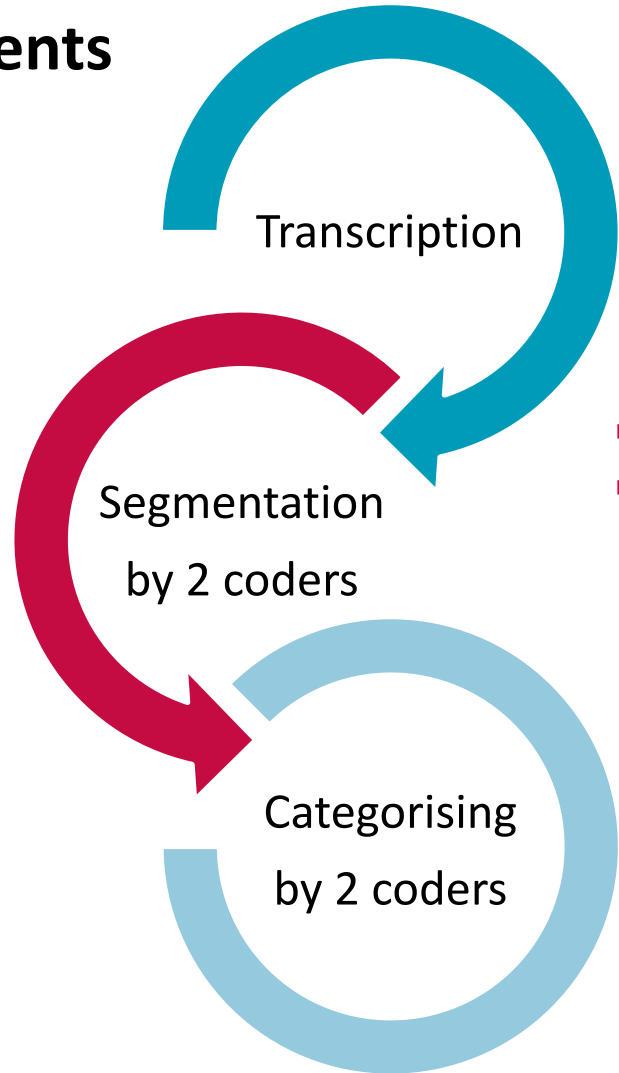
- Area of interest on
 - 4 pupils
 - Group
 - Trainee teacher



Methodology

Verbal 's comments

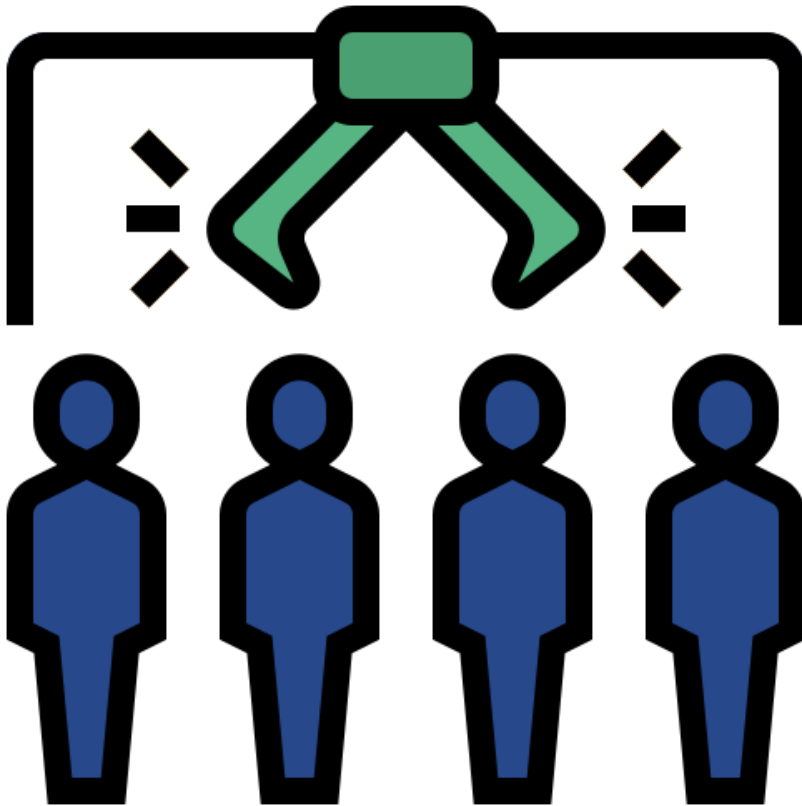
PT= 1437 segments
UST = 379 segments



- cfr Paillé & Muchellini (2007)
- validaded if 80% between the coders (Miles & Huberman, 2003)

- N-vivo-12
- 2 coders

Sample



- **19 PT enrolled in the micro-teaching training system of AESS program - academic year 2022-2023 (group 1)**
 - 16 valid eyetracking data for PT
 - 19 valid verbal data for PT
- **6 UST involved in the debriefing process (secondary education) by the INAS (group 2)**
 - Average experience ranged 16 years
 - 2 PH/D and 4 PH in Education Sciences
 - Valid data (eyetracking and verbal): OK

Some questions and hypotheses

OBSERVING

RQ 1: Individual being observed?

H: Attention is more restricted in PT ; UST to observe a larger number of individual (eg. Yamamoto & Imai-Matsumura, 2013; Cortina et al., 2015).

-> fixed and moving AOI are used to identify group of pupils and trainee teacher.

-> Indicators: 1st view, fixation, (Re-)view

QR 2: visual strategies employed by UST and PT ?

H: UST eye scanning capabilities are more dynamic than PT (van den Bogert et al. 2014).

-> fixed and moving AOI are used to identify target pupils.

-> Indicators: 1st view, fixation, (Re-)view

Some questions and hypotheses

REFLECTING

(adapted from Vifquain & Frenay, 2018)

RQ.3: Objects spontaneously formulated?

H: PT focus on device for learning and pupils (Vifquain & Frenay, 2018) and UST focus on teacher

-> Classification based on « teaching-learning model » (Derobertmeasure & Dehon, 2015) : objective; teacher; pupils; learning topic; device for learning + context

RQ.4. Type of reasoning process formulated?

H: Description and interpretation by the PT (Vifquain & Frenay, 2018) and evaluation by the UST (Cohen et al. 2013)

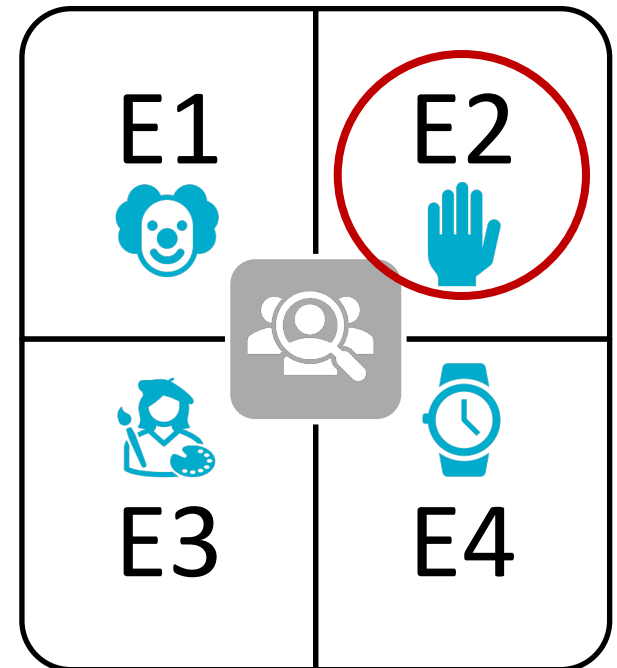
-> Classification based on Sherin & van Es (2008), Seidel & Stürmer (2014) and Vifquain (2015): description; question; evaluation; interpretation; prediction

- **Cross-referencing** (as Vifquain & Frenay, 2018)
- **Inter- and intra-coder** (Landis & Cock, 1977)

Results: observing

QR1. Individual being observed?

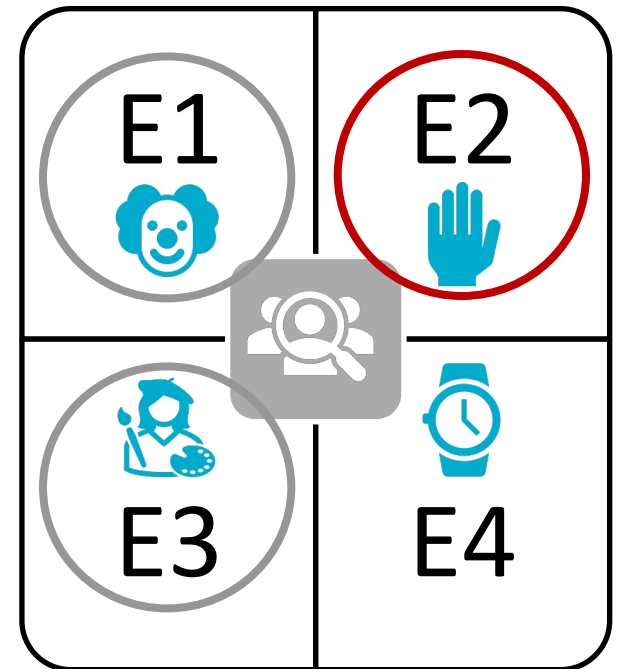
- The fixation scores between the participants in the study, namely the students and the trainee, are **comparable**.
- > E.g. : Focus on teacher
- PT = 33, 9% (fixation)
 - UST= 39% (fixation)
- **Significant difference** of target pupil
 - PT= focus on pupil E2
 - UST= focus on pupil E1 and E3



Results: observing

QR1. Individual being observed?

- **No** significant differences in the mean and dispersion between PT and UST, regardless of the individuals (pupil vs. trainee teacher).
-> E.g. : Focus on teacher
 - PT = 33, 9%
 - UST= 39%
- **Significant difference** of target pupil
 - PT= focus on pupil E2
 - UST= focus on pupil E1 and E3



Results: observing

QR 2: visual strategies employed by UST and PT ?

- Fixation
- First view
- Revisit

Revisits in E1	Revisits in E2
T= 5.965	T= 1.2
$p = <.001$	$p = 0.244$
Df=20	Df=20
Revisits in E3	Revisits in E4
T= 2.395	T=1.735
$p =0.027$	$p =0.098$
Df=20	Df=20

Cohen's kappa values
(mean):
PT = 0.807; UST = 0.806

Results: reflecting

RQ.3: Objects spontaneously formulated?

PT	Objective	Trainee Teacher	Pupil	Learning topic	Device for learning	Context	Other	Total
Description	0,7	1	21,3	0,68	26,5	4,7	0	54,88
Question	0	2,5	0,99	0	3,1	0,3	0	6,89
Evaluation	0	0	2	0	6,7	0,99	0	9,69
Interpretation	0	0	9,9	0	9,86	4,3	0	24,06
Prediction	0	0	0	1	3,1	0,4	0	4,5
Other	0	0	0	0	0	0	0	0
Total	0,7	3,5	34,19	1,68	49,26	10,69	0	100

UST	Objective	Trainee Teacher	Pupil	Learning topic	Device for learning	Context	Other	Total
Description	3,11	21,5	25,1	0,3	4,28	6,23	0	60,52
Question	0	1,36	0,76	0,5	1,56	1,17	0	5,35
Evaluation	1,56	9,92	3,11	0,5	6,23	6,81	0	28,13
Interpretation	0,19	0,76	1,17	0	2,72	0,58	0	5,42
Prediction	0	0	0	0	0	0,58	0	0,58
Other	0	0	0	0	0	0	0	0
Total	4,86	33,54	30,14	1,3	14,79	15,37	0	100

Percentages by group of participants. One table = 100%.

Results: reflecting

RQ.4. Type of reasoning process formulated?

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Percentages by group of participants. One table = 100%.

Conclusions

QR	Hypothesis	Answer
RQ. 1: individual	PT: less individual in the video UST: more individual in the video	No
	PT: focused on the participatory pupils UST: Focus on off-task pupils	Yes
PT vs UST		
<ul style="list-style-type: none"> ▪ Difficulties in concentrating on less relevant elements (= Keskin et al. 2024) vs UST ▪ Difficulties in identifying critical incidents in the classroom (= van den Bogert et al., 2014; Wolff et al., 2016; Yamamoto & Imai-Matsumura, 2013) vs UST ▪ Centred on the participative pupil (= Shinoda et al. 2021) vs UST 		

Conclusions

QR	Hypothesis	Answer
RQ.2. Visual strategy	Difference between PT and UST in fixations, first views and revisits	Only revisits (significant)
<ul style="list-style-type: none">■ UST : immediate strategies (= Wolff et al., 2016; Stürmer et al., 2017; Kosel et al., 2023; Yamamoto & Imai-Matsumura, 2013) -> revisit -> glance■ No more even appearance (fixation) between PT and UST (\neq Keskin et al. 2024)		

Conclusions

QR	Hypothesis	Answer
QR.3. Verbalised objects	PT= Pupil and system UST: Teacher	Yes (motivation of the pupils, involvement of the pupils in the required tasks) Yes+ pupil

- UST made **17 times more** comments about trainee teacher on screen than PT
!! Fixation on trainee teacher !!
 - PT = 33, 9%
 - UST= 39%
- Discrepancy between what PT see on the screen and what they were thinking about at the same time?
- A reluctance on the part of the PT to express their thoughts clearly about the observed teaching practice of the trainee teacher « like them »?

Conclusions

QR	Hypothesis	Answer
QR.4. Process	PT: description and interpretation UST: evaluation and interpretation	yes No-> description and evaluation
<ul style="list-style-type: none">■ PT<ul style="list-style-type: none">■ Evaluation with few nuances: OK / KO■ Interpreting based on very few theoretical elements: « pupil seem motivated » (= Derobertmeasure, 2012)■ UST<ul style="list-style-type: none">■ evaluate and propose alternative■ Main functions of UST: observe and evaluate through feedback (= Cohen et al. 2013)		

-> VP's PT and their UST: different results and some similarities

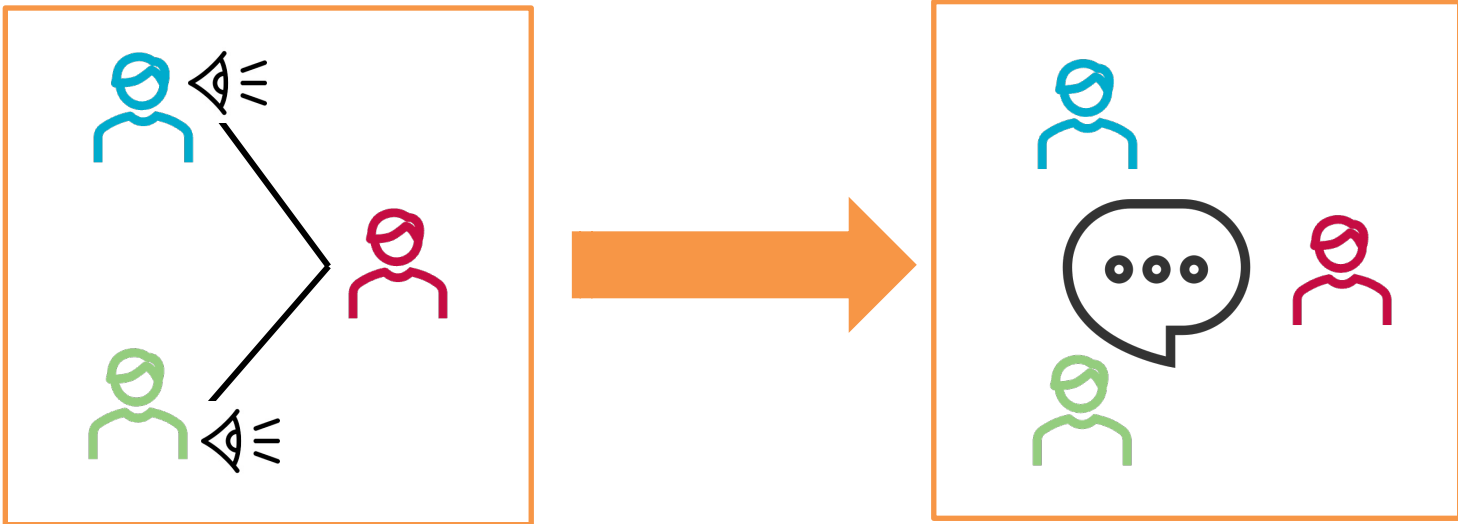
-> VP's trainer is close to the 'expert VP' described in the litterature

Limits and perspectives

- AOI: size, duration of evenement
- View B data : some differences with view A when PT and UST discover the video
 - E2 percentage of fixations is 4 times higher in view B than A by both PT and UST
 - E1: ignored by PT and UST in view A, then fixated in view B
- Specificity of certain UST
 - UST_1: 17 times more interpretative statements than other UST.
 - UST_6: Eye movement more dynamic than the others, with more eye exits.
 - During the placement period, the PST observe the trainee teacher in classroom.
 - > replicate this study for the training supervisors.
 - > They should also wear ET glasses (UST and training supervisor)

Limits and perspectives

- During the placement period, the PST observe the trainee teacher in the classroom.
 - > replicate this study for the training supervisors.
 - > UST and training supervisor should also wear eyetracking glasses



https://www.researchgate.net/publication/377923217_Maitre_de_stage_et_superviseur_Comment_s%27approprient-ils_l%27evaluation_du_stagiaire_lors_des_entretiens_post-lecon

Thank you !

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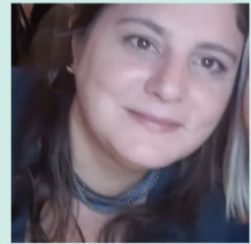
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