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Profiles of Primary School Teachers' Engagement with Generative AI

The Role of Risk, Trust, and Professional Development Needs

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Generative AI has arrived in schools – teachers are still catching up

~1 in 3 teachers report having used AI in their work

3 in 4 report lacking knowledge or skills to teach using AI

7 in 10 worry that AI facilitates plagiarism and cheating

Why primary education is special

- Foundational learning and development of basic skills
- Young, particularly vulnerable learners
- Heightened ethical responsibility and data protection
- Bavaria: PD obligation, but no mandatory AI-specific PD; strict GDPR-based rules

Sources: OECD (2025), TALIS 2024 – averages across OECD systems, lower-secondary teachers; Scheiter et al. (2025); Nuryani et al. (2026)

Theoretical framing: from acceptance to integration

Technology Acceptance Model (Davis, 1989; Venkatesh & Davis, 2000)



… but positive intentions do not automatically lead to classroom use (Ertmer, 1999; Hew & Brush, 2007)

Will–Skill–Tool model (Knezek et al., 2000)



Research gap

Population

Research focuses on pre-service teachers and higher education – primary school teachers are underrepresented

Approach

Risk, trust, and PD needs are mostly examined separately and variable-centered

Use

Little is known about how these evaluations relate to current and intended AI use

Person-centered perspective

Are there distinct teacher profiles – recurring combinations of risk, trust, and PD needs?

And how do these profiles differ in AI use?

Research questions

RQ1	How do primary school teachers perceive (risks, trust, PD needs) and use generative AI?
RQ2	How are perceived risks, trust in AI, and PD needs related to each other?
RQ3	Can distinct teacher profiles be identified based on their perceptions of generative AI – and how can they be characterized?
RQ4	How do these profiles differ regarding their current and intended use of generative AI?

Focus of this talk

Method: sample and measures

N = 295

primary school teachers, Bavaria, 2023/24

93 %

female

18.6 years

teaching experience (SD = 10.5)

Each assessed as current and intended use

Global evaluative indicators (1 = strongly disagree … 6 = strongly agree)

Risk	*"When using ChatGPT or similar AI tools in school, I see more risks than opportunities."*
Trust	*"I trust tools such as ChatGPT or similar AI applications for use in school."*
PD needs	*"I would like to receive professional development to learn more about the use of ChatGPT or similar AI tools in school."*

Instructional use
7 items (e.g., lesson planning, materials) · current α = .87 · intended α = .93

Classroom integration
2 items (teaching, student activities) · Spearman–Brown .71 / .89

Method: data analysis

1 RQ1 · RQ2

Descriptives & correlations

Means, SDs; Pearson r

2 RQ3

Hierarchical clustering

Ward's method, squared Euclidean distance (z-scores)

3 RQ3

k-means (2–4 clusters)

Silhouette widths: .35 (2), .30 (3), .32 (4) → 3 clusters retained for parsimony and interpretability

4 RQ4

One-way ANOVAs

Tukey HSD post hoc; effect size η^2

Transparency note: agreement between hierarchical and k-means assignments was limited (ARI = 0.26) → individual assignments are somewhat method-sensitive

Analyses in R 4.3.0; missing data 2.6 % (MCAR, Little's test n.s.) → listwise deletion

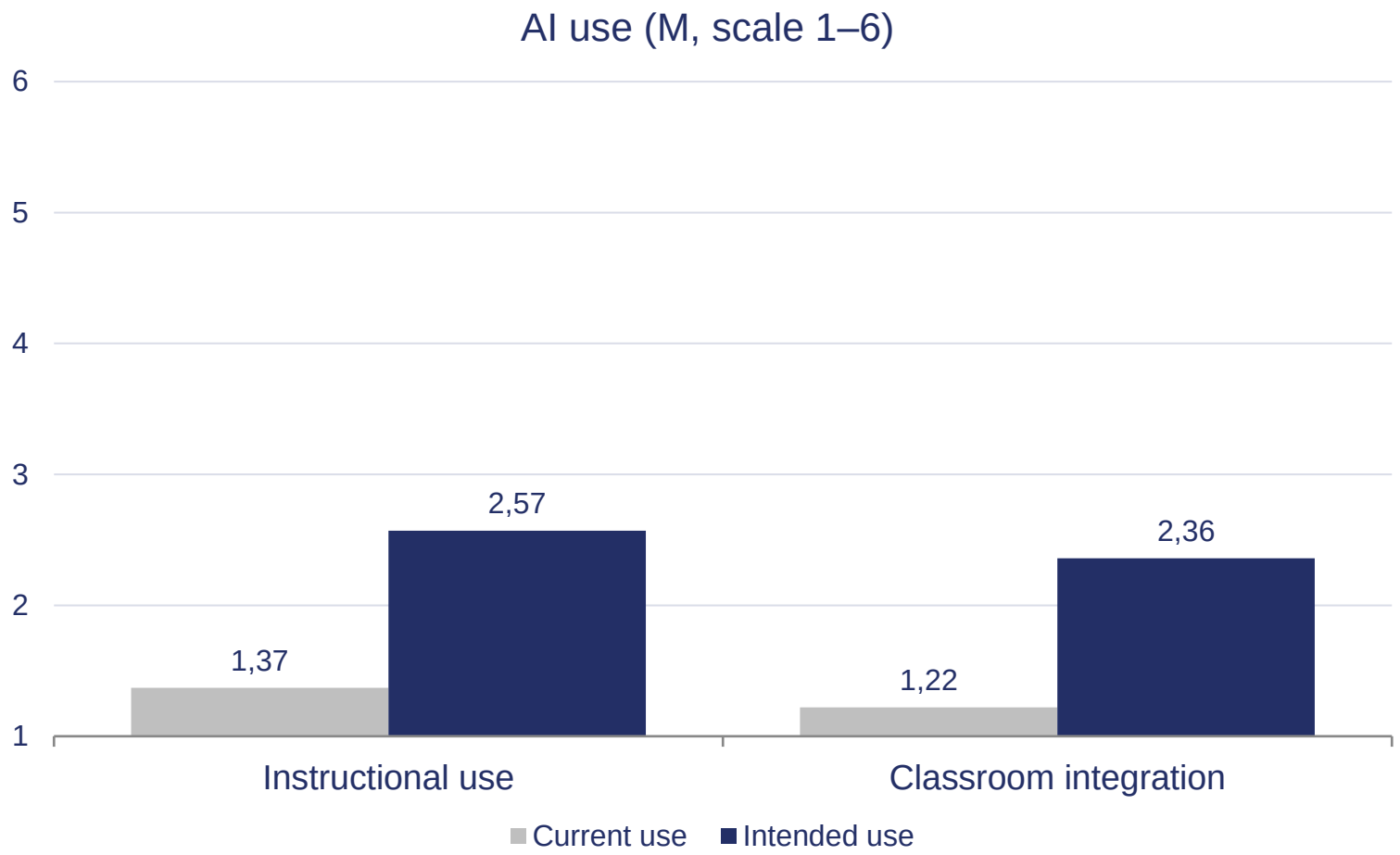
RQ1: Cautious openness – and a gap between intention and use

Perceptions (M, scale 1–6)

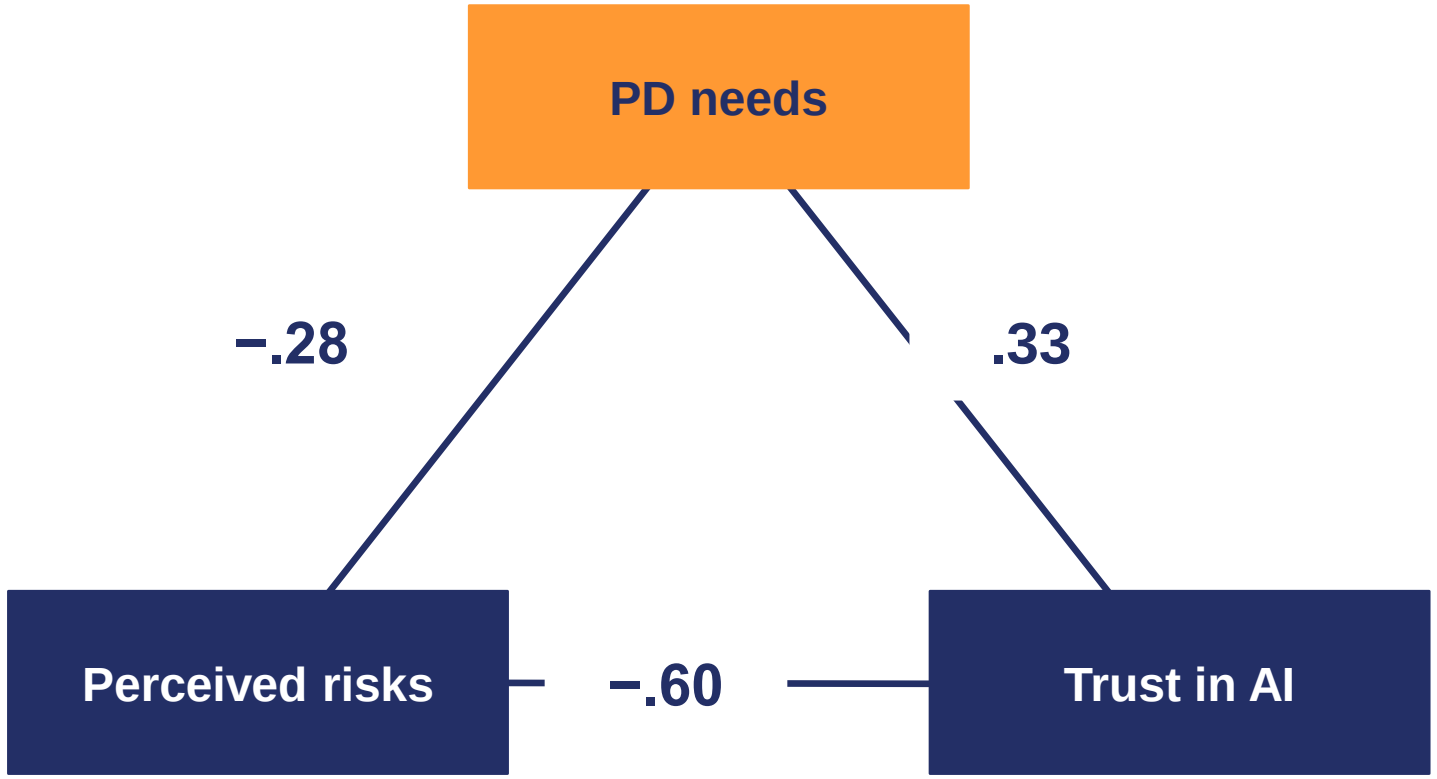
3.75 Perceived risks

2.73 Trust in AI

4.12 PD needs



RQ2: Risk, trust, and PD needs form a coherent pattern



Variable-centered reading

More risk → less trust → less interest in PD

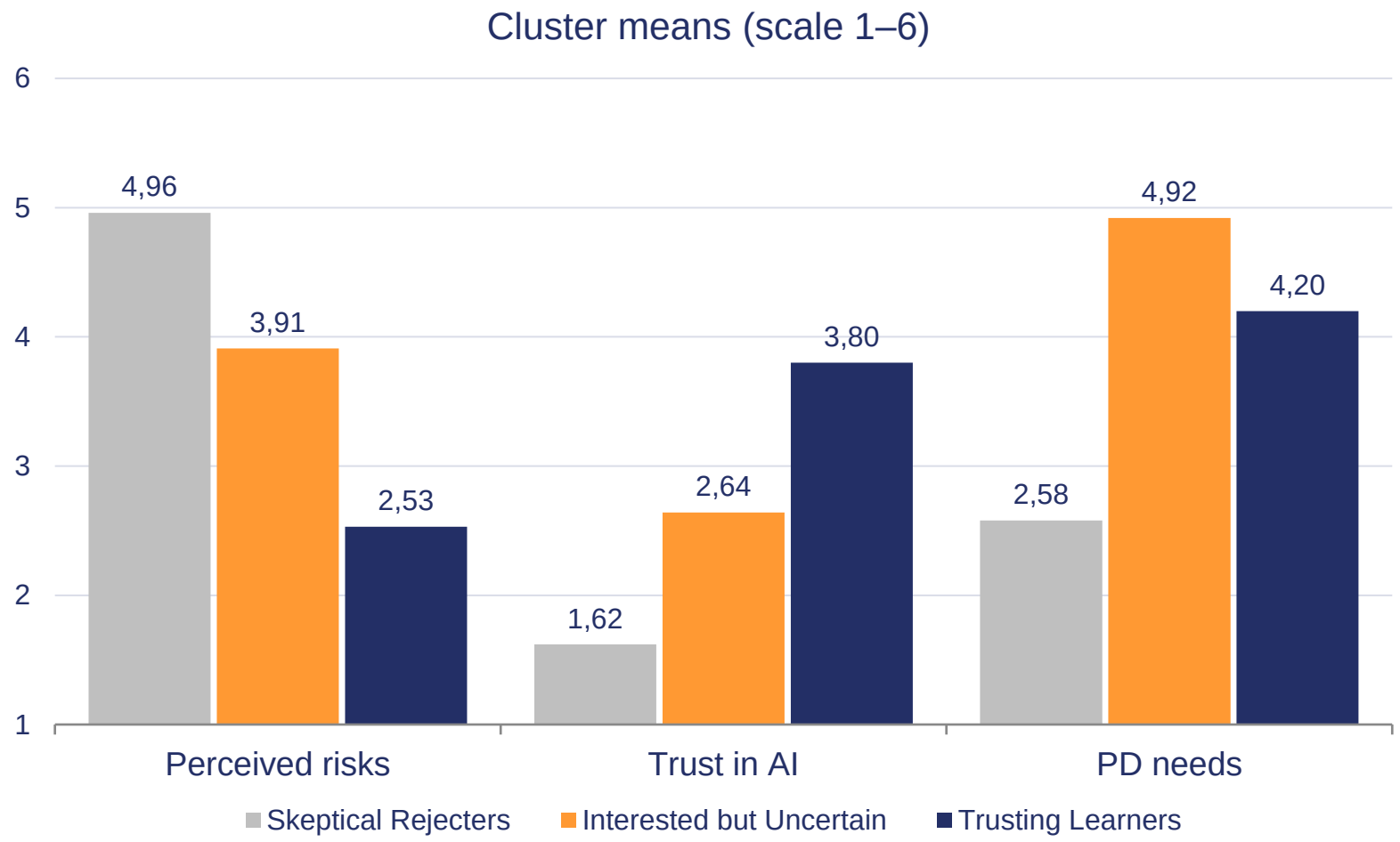
Caution: risk item (“more risks than opportunities”) partly overlaps with the global trust judgment

Pearson correlations, all p < .001

RQ3: Three profiles of AI engagement

Person-centered cluster analysis based on perceived risks, trust in AI, and PD needs

RQ3: Three distinct profiles emerged



Share of teachers (n = 292)

25.0 % **Skeptical Rejecters**
n = 73

44.9 % **Interested but Uncertain**
n = 131

30.1 % **Trusting Learners**
n = 88

RQ3: Characterizing the profiles

25.0 %

Skeptical Rejecters

- Very high perceived risks
- Very low trust
- Comparatively low PD needs

44.9 %

Interested but Uncertain

- Relatively high perceived risks
- Low to moderate trust
- Highest PD needs

30.1 %

Trusting Learners

- Low perceived risks
- Highest trust
- Substantial PD needs

Teaching experience: Skeptical Rejecters M = 21.4 years vs. Trusting Learners M = 16.4 years ($F(2, 266) = 4.03$, $p = .019$, $\eta^2 = .03$)

Spotlight: the largest group is interested – but uncertain

44.9 %

of teachers are Interested but Uncertain – the largest profile

4.92

highest PD needs of all profiles – not among the most skeptical teachers

Variable-centered view

Higher risk → lower PD needs (r = −.28)

Suggests: skeptical teachers don't want to learn

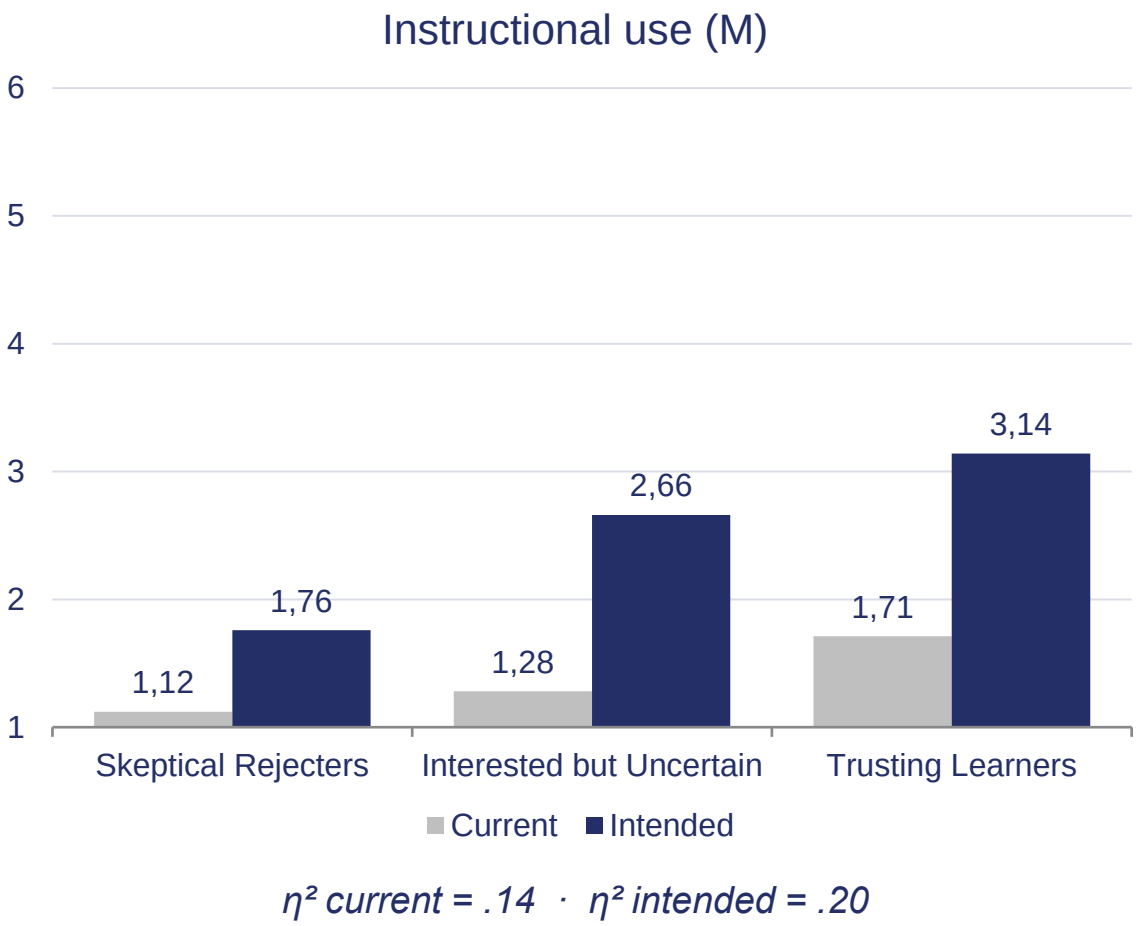
Person-centered view

A large subgroup combines concerns with the strongest wish to learn

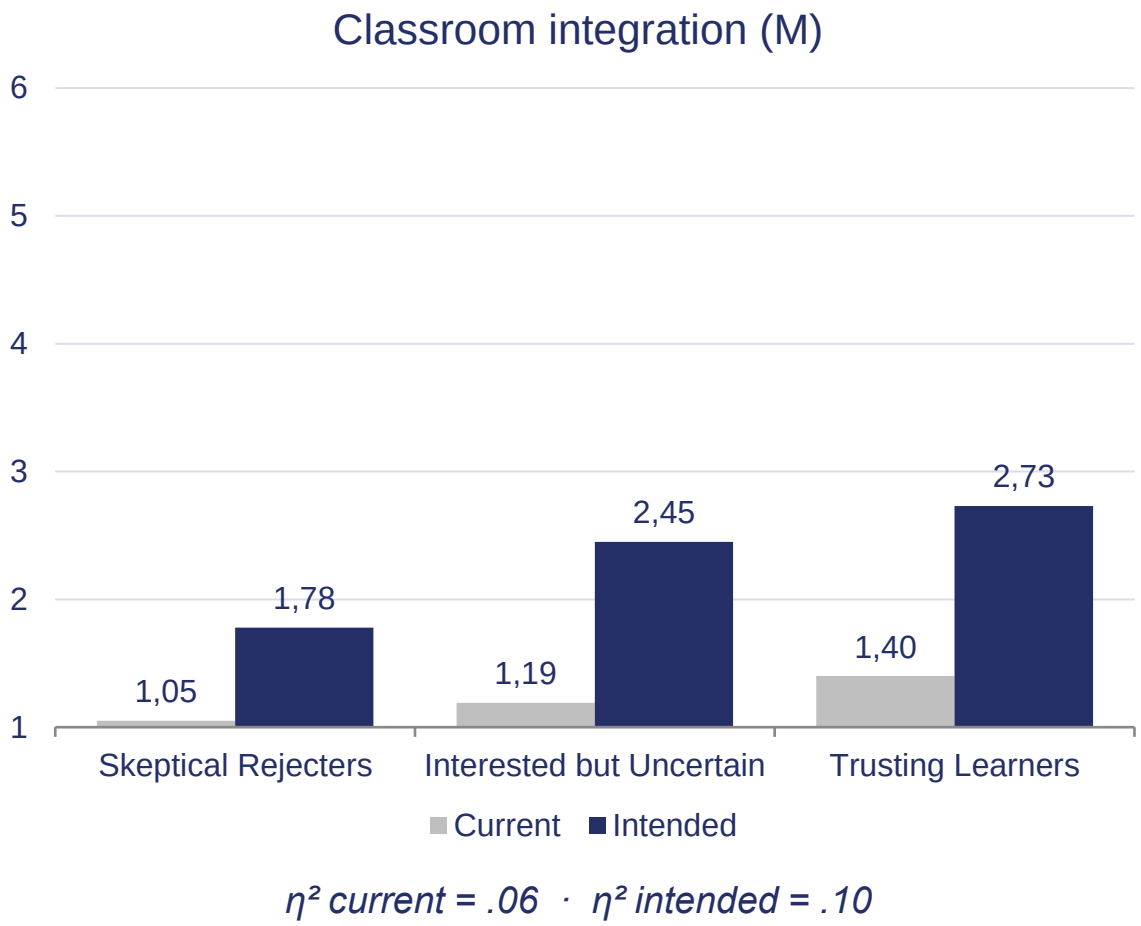
→ **"productive uncertainty"**

Uncertainty is not necessarily a barrier – it can motivate teachers to seek knowledge and support.

RQ4: Profiles differ in AI use – especially in intended use



η² current = .14 · η² intended = .20



η² current = .06 · η² intended = .10

One-way ANOVAs, all p < .001; Tukey HSD: Trusting Learners > other profiles in current instructional use

Discussion: profiles are not positions on a single continuum

Not this …



… but this: different ways of balancing opportunities and risks

Skeptical Rejecters
Concerns dominate – little interest in engaging

Interested but Uncertain
Concerns + strongest motivation to learn

Trusting Learners
Openness + continued wish to learn

Overall: a state of cautious openness – plausibly shaped by the Bavarian context (strict data protection, no mandatory AI-specific PD)

Discussion: the intention–usage gap and a “pedagogical brake”?

Even Trusting Learners (instructional use, M)



Gap across all profiles

Positive evaluations are necessary, but not sufficient for AI use

Theory-consistent

TAM: perceptions shape intentions first · Will–Skill–Tool: will alone is not enough – skill (PD needs) and tool (context) matter

A “pedagogical brake”? (tentative)

Deliberate caution with young learners – a professionally reasoned response rather than resistance; needs empirical testing

Limitations

1 Sample & context

Bavarian primary teachers; voluntary participation → possible self-selection; specific regulatory context

2 Design & data

Cross-sectional, self-report → no causal conclusions; intentions ≠ practice

3 Measurement

Single global items instead of multidimensional scales; “ChatGPT or similar” framing; method-sensitive clusters (ARI = 0.26)

4 Scope & timing

AI literacy, experience, school support not assessed; data from 2023/24 – early adoption phase

Implications: no one-size-fits-all professional development

Skeptical Rejecters
Address fundamental concerns

- Spaces for critical dialogue
- Role of AI for child development and pedagogical responsibility

Interested but Uncertain
Build confidence, reduce uncertainty

- Transparent explanations of AI systems
- Guided experimentation
- Structured ethical & pedagogical reflection

Trusting Learners
Deepen and refine practice

- Critical evaluation of AI output
- Designing AI-supported learning environments
- Subject-specific applications

Largest and most promising target group: Interested but Uncertain teachers (44.9 %)

Beyond technical skills: AI literacy and professional judgment

The key question is not only how to use AI,
but when, how, and for what purposes
AI should be used with young learners.

1

Knowledge

How AI systems work – and where their limits are

2

Critical reflection

Evaluate AI outputs, ethical and pedagogical implications

3

Professional judgment

Protect foundational learning, children's autonomy, and teacher–student interaction

AI literacy frameworks: Long & Magerko (2020); UNESCO (2024) AI competency framework for teachers

Take-home messages

1

Heterogeneity

Primary school teachers form three distinct profiles of AI engagement – not one homogeneous group.

2

Productive uncertainty

The largest group (44.9 %) is interested but uncertain – and reports the strongest wish for PD.

3

Intention–usage gap

Intended use exceeds current use in all profiles: PD should foster competencies and informed professional judgment.

Next steps: longitudinal designs (movement between profiles?) · multidimensional instruments · AI literacy as predictor

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Thank you for your attention!

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