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# Digital Transformation? A longitudinal interview study on teachers' acceptance and usage of digital tools in times of Covid-19

**Olivia Wohlfart & Ingo Wagner**

digiMINT

*"It feels like we're building the plane while we're flying it and the destination keeps changing on us."*

(Heidi Crumrine, high school English teacher;
cited in Cardoza, 2021)

# Content

# Introduction: „What we (think to) know so far“

Teachers are crucial for the process of digitalization (Bridwell-Mitchell, 2015; Lockton & Fargasson, 2019; Wohlfart & Wagner, 2023)

Teachers’ digital literacy is more important for digitalization than rich access to digital technologies (Pettersson, 2018; Wohlfart & Wagner, 2023)

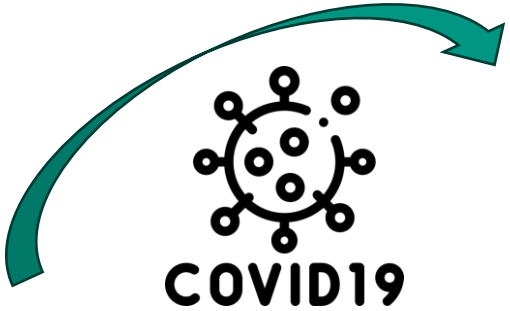
Difference between intent to integrate technology vs. actual integration (Lee et al., 2003; Scherer et al., 2019)

Technology integration and application are closely linked with technology acceptance (Davis, 1986)

*Organizational*, *technological* and *individual* factors influence teachers’ technology acceptance and integration (Scherer & Teo, 2019)

Teaching experience (rather than age) influences technology acceptance/integration (Spiteri & Chang Rundgren, 2020; Wohlfart et al., 2021)

# Introduction: „What we (think to) know so far“




## Pre-Pandemic:

- External vs. internal obstacles for integrating digital tools (Al Mulhim, 2014; Bingimlas, 2009; Hatlevik, 2017; Lockton & Fargason, 2019; Schmid et al., 2017; Wohlfart et al., 2023)

## Post-Pandemic:

- Teachers’ professional role changed complicatedly during the Covid-19 pandemic (Li & Yu, 2022)
- Teachers’ career satisfaction declined during the Covid-19 pandemic (e.g. Aktan & Toraman, 2022)
- Teachers’ digital literacy/competence increased during the Covid-19 pandemic (e.g. Myyry et al., 2022)

# Research Questions: „What we don‘t know“

- How has teachers’ acceptance and usage of digital tools developed across time since the outbreak of the Covid-19 pandemic?
- Which factors influence a lasting integration of digital tools in teaching?

# Theoretical Background: „How to understand“

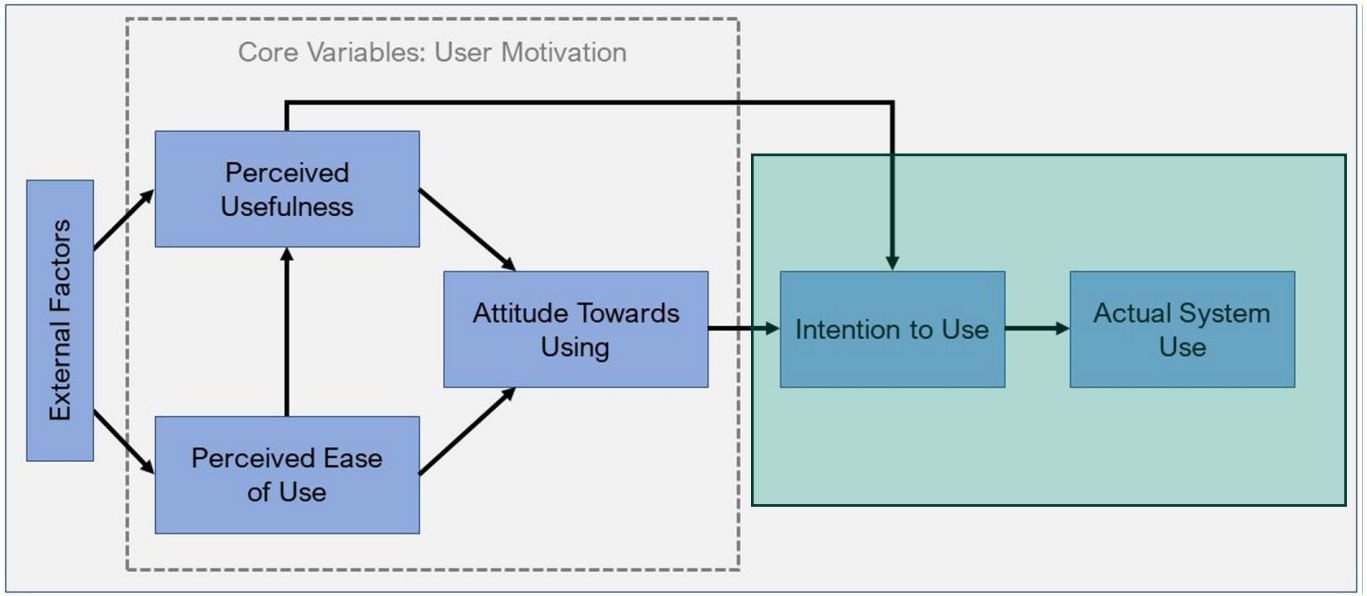



**Figure 1**. Technology acceptance model (own illustration based on Davis, 1989).

# Method: „Searching for answers“

- Qualitative semi-structured interview study with longitudinal design (Denzin & Lincoln, 2011)
  - 1st round: 15 teachers in May/June 2020
  - 2nd round: 12 teachers in May/June 2021
  - 3rd round: 10 teachers in May/June 2022
- 37 interviews (each 29-66 minutes)
- Transcription & anonymization (Dresing & Pehl, 2020)
- Qualitative content analysis based on Mayring (2015)

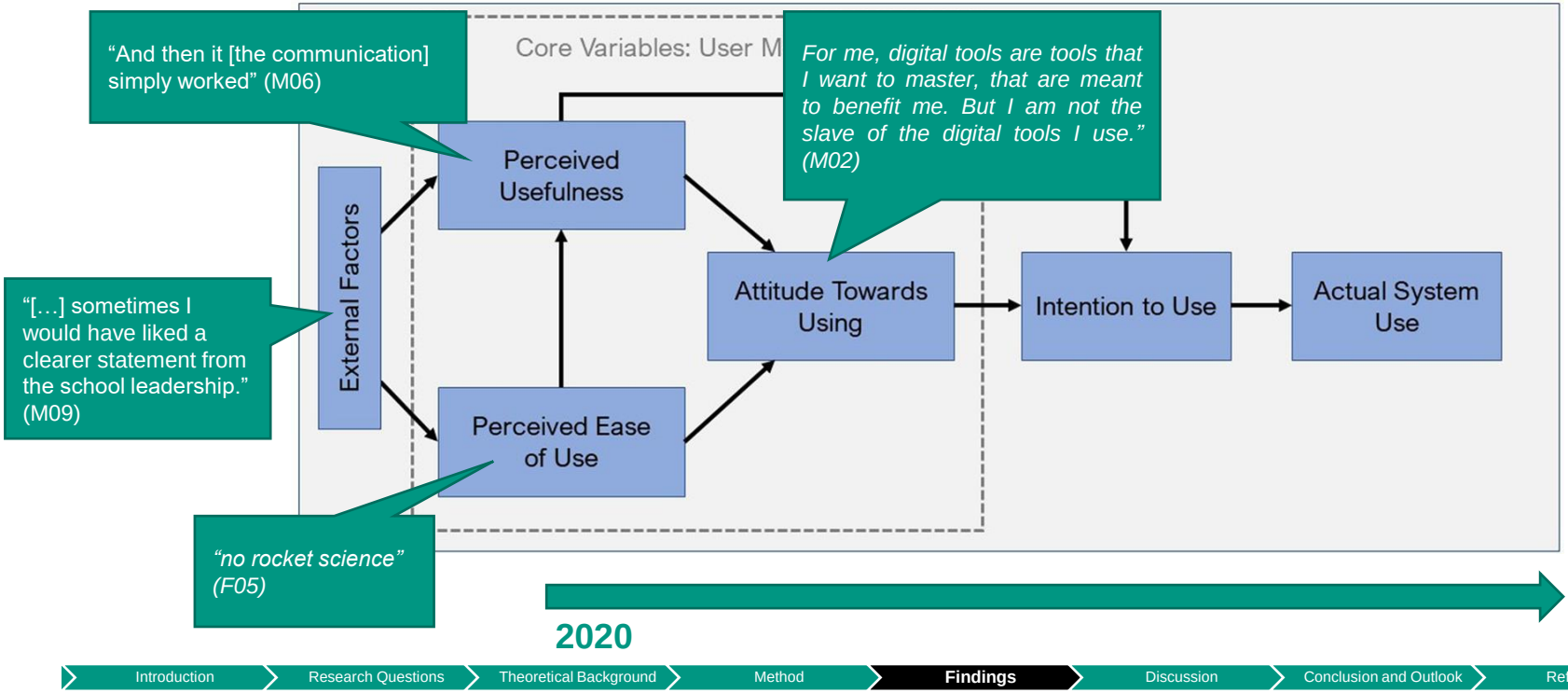
# Method: Participants

| Pseudonym | Age* | Subjects Taught | Teaching experience (in years)* | Teaching load (in hours)** | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|
| M01 | 50 | Music, Physical Education (P.E.), Maths | 14 | 25 | ✓ | ✓ | ✓ |
| M02 | 45 | Biology, Geography, Ethics, Science & Technology | 15 | 25 | ✓ | ✓ | ✓ |
| M03 | 37 | Maths & P.E. | 2 | 12,5 | ✓ | ✓ | ✓ |
| M04 | 45 | Maths & Geography | 16 | 25 | ✓ | ✓ | x |
| M05 | 31 | Maths & P.E. | 1 | 25 | ✓ | ✓ | ✓ |
| M06 | 38 | German, History, Social Studies | 6 | 22 | ✓ | ✓ | ✓ |
| M07 | 38 | Spanish, History, Social Studies | 6 | 24 | ✓ | ✓ | ✓ |
| M08 | 31 | Maths & P.E. | 1 | 25 | ✓ | ✓ | ✓ |
| M09 | 36 | Chemistry, Biology, Science & Technology, | 6 | 25 | ✓ | x | x |
| F01 | 29 | Maths, Biology, Computer Science, Science & Technology | 3 | 12,5 | ✓ | x | x |
| F02 | 60 | German & Geography | 26 | 22 | ✓ | ✓ | ✓ |
| F03 | 41 | Biology, Chemistry, Science & Technology | 11 | 16 | ✓ | ✓ | ✓ |
| F04 | 28 | Biology & Maths | 0 | 20 | ✓ | ✓ | ✓ |
| F05 | 28 | Physics, Maths, Science & Technology | 0 | 23 | ✓ | ✓ | x |
| F06 | 38 | P.E. & German | 9 | 8 | ✓ | x | x |

*Sociodemographic information based on responses in 2020.
**A full teaching load consists of 25 hours/week.

**Table 1:** Participants (sorted by gender)

# Findings: „Revealing answers“



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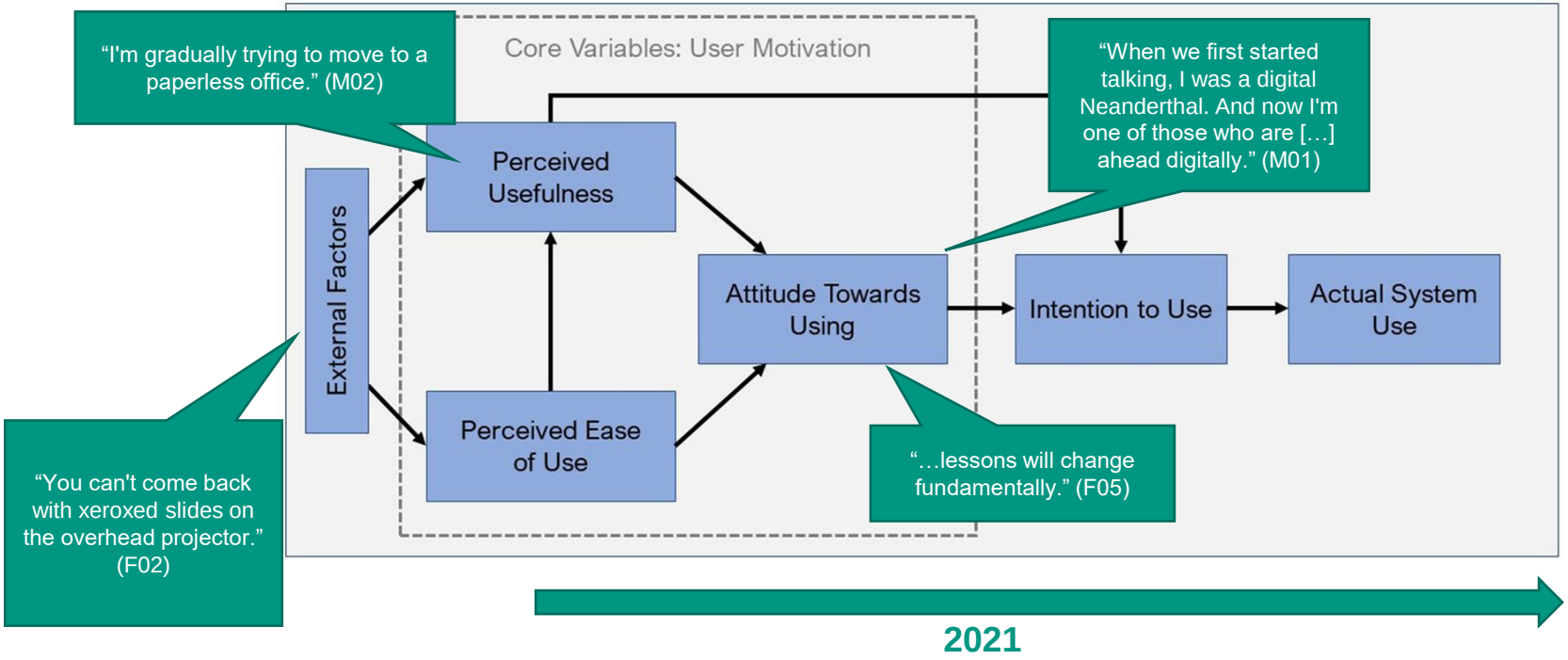

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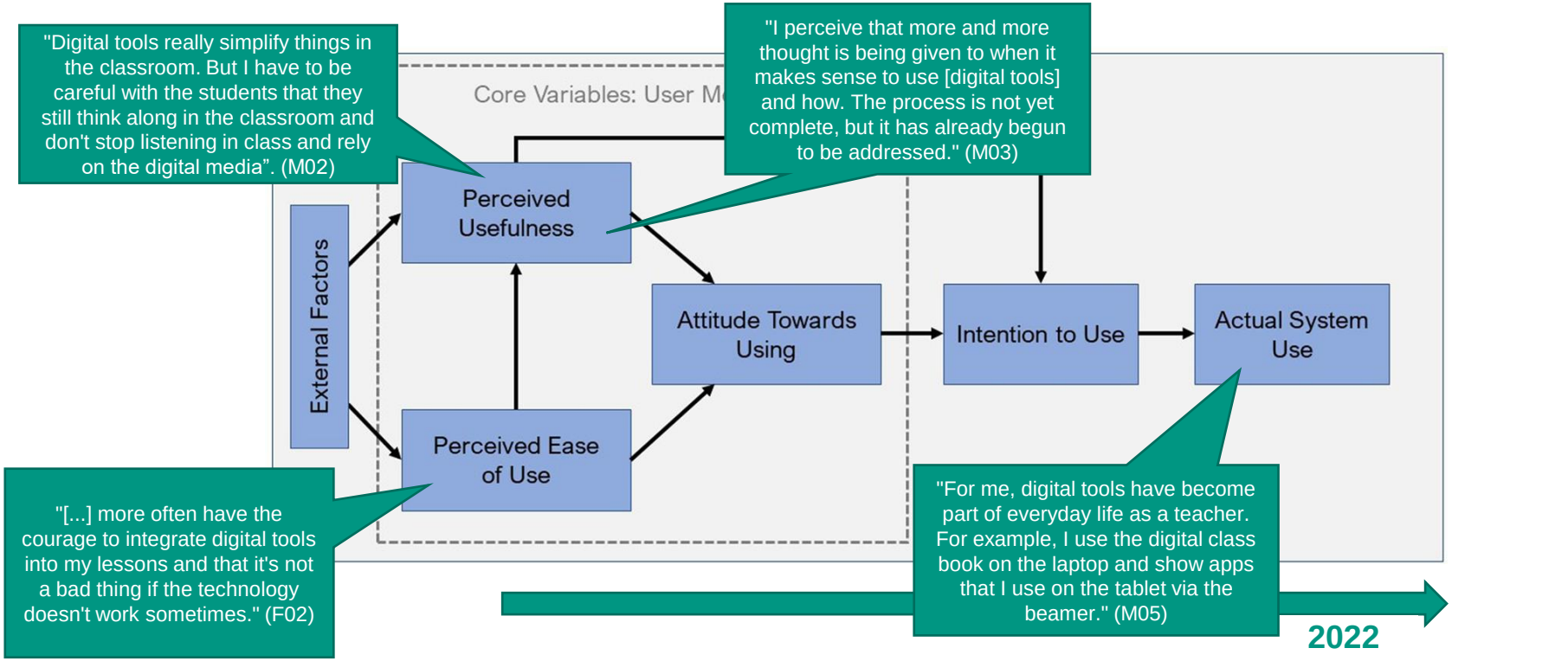

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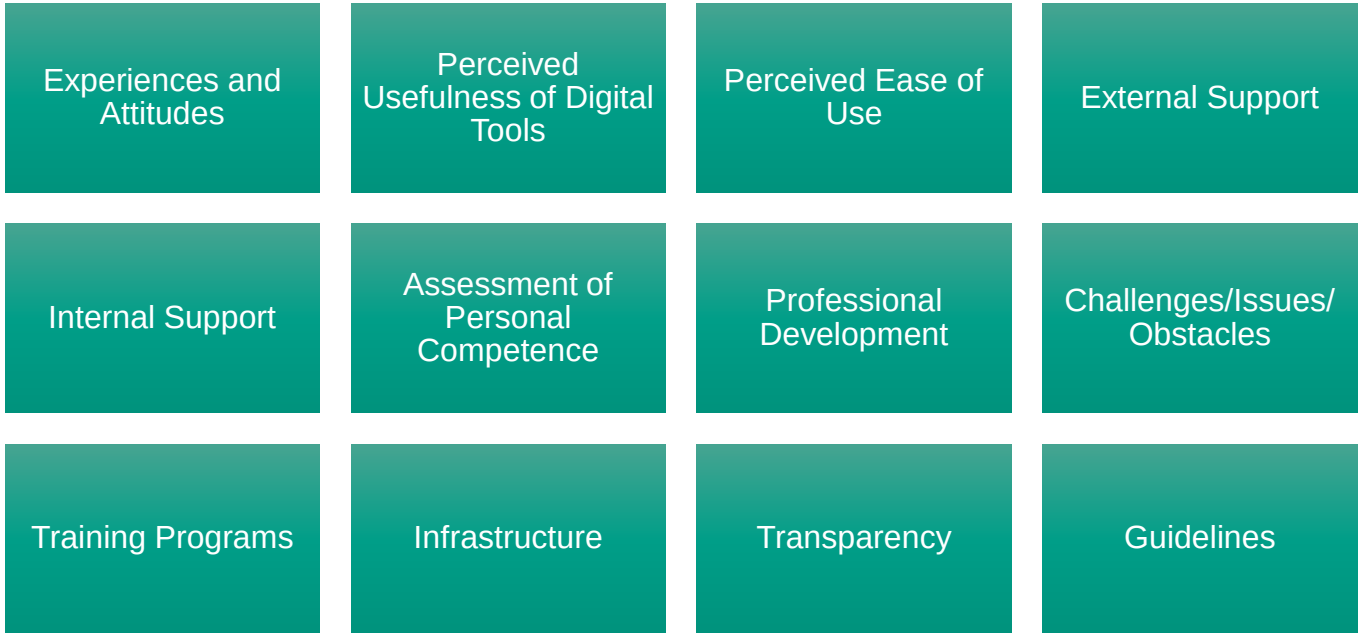


Fig. 2: Selection of identified categories influencing digital transformation

# Discussion: „Understanding better“

*Quick reminder what we‘re trying to understand better:*

How has teachers’ acceptance and usage of digital tools developed across time since the outbreak of the Covid-19 pandemic?

Which factors influence a lasting integration of digital tools in teaching?

# Discussion: „Understanding better“

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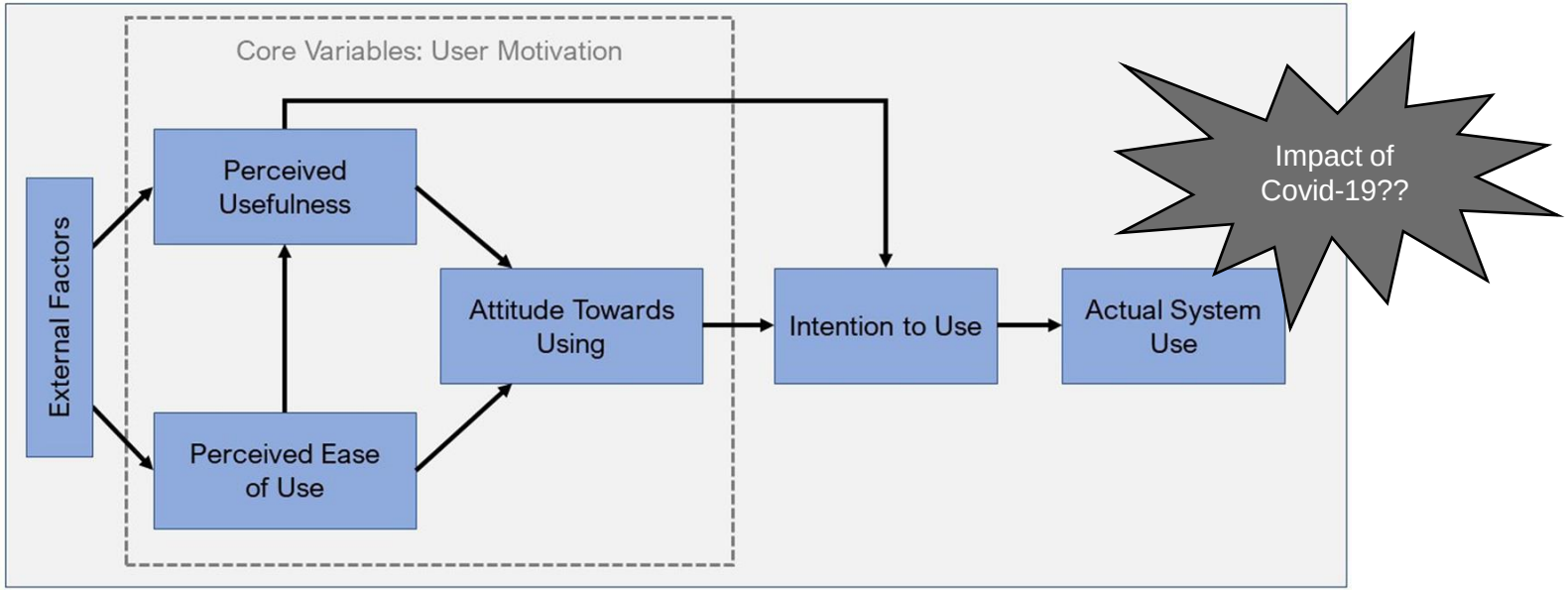

# Discussion: „Understanding better“

*How has teachers’ acceptance and usage of digital tools developed across time since the outbreak of the Covid-19 pandemic?*

- User motivation (Usefulness, Perceived Ease of Use, Attitudes) have developed and grown across time!
  - More specific -> clearer concepts -> less inhibitions
- External factors influenced motivation to varying degrees
  - External and internal support
  - Infrastructure
  - Heterogeneity of Students and Teachers
  - Rules and regulations

BUT:
attitude towards use
≠
actual integration

# Discussion: „Understanding better“

*Which factors influence a lasting integration of digital tools in teaching?*


(cf. among others: Bridwell-Mitchell, 2015; Li & Yu, 2022; Scherer & Teo, 2019; Spillane, 2006; Wohlfart et al., 2021; Wohlfart & Wagner, 2023)

# Conclusion and Outlook: „So what?“

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Covid-19 = catalyst for digital transformation of education!

Acceptance and integration of digital tools among teachers has improved

Will this transformation be sustainable?

How can empirical educational research help?

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(Heidi Crumrine, high school English teacher;
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**Contact:**
olivia.wohlfart@kit.edu