



The influence of digital devices on learning interest, engagement and academic performance in basic police training – Experiences and findings

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Speakers



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Work priorities

- Continuing education of teachers
- Media education
- Evaluation

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Work priorities

- Digitalisation of police training
- Supply of hardware and software

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Table of Content

- Short overview: Bavarian Police Training
- Empirical Findings
- Practical Implications
- Prospects



Bavarian Police Training



Pictures: Bavarian Police



Bavarian Police

Bayerische
Bereitschaftspolizei



© Bavarian Police, Swearing-in Ceremony, 2017

Population 13.1 million
Area 70,400 km²
Capital Munich

32,600 police officers (all ranks)
↶ 3,800 trainees (2022)
+ administrative staff

44,000 approx.

Bavarian Police Training

- two and a half years of police training (divided into five terms) with approx. 5000 hours of classroom lessons + practical trainings
- 2 internships at local police stations for 4 weeks (during the 3rd term of training) and for 12 weeks (during the 4th term of training)
- 4 guided themes: office operations, traffic, (modular training) on patrol, crime fighting
- 6 police academies, divided in 28 organisational units of 100 to 160 police officer trainees plus staff
- around 700 police teachers and instructors
- all trainees perform their complete training process within their respective units from start to finish



Pictures: Bavarian Police, 2021



Current situation – Overview on digital equipment

- By 2025 (perhaps earlier), every police officer trainee will receive a convertible
- March 2022: 2.300 police officer trainees received a personal convertible (police officer trainees from the 2nd – 4th-term)
- mPolice smartphones in sufficient quantity for each organisational unit
- Digital whiteboards in every classroom of the police academies
- Use of the learning management system (LMS) including newly created learning and teaching materials
- Each police academy is provided with an operation centre for practice purposes
- Improvement of the technical infrastructure (for example procurement of mobile wlan-router)



Starting point

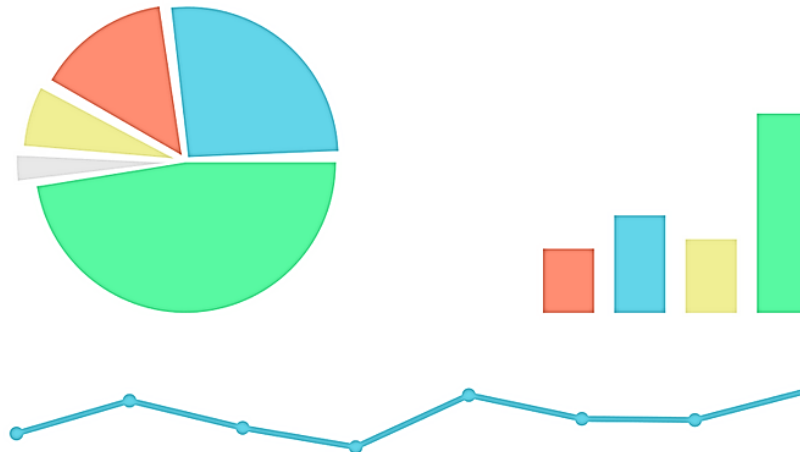
- in October 2019 the Bavarian Police decided to equip one organisational unit with digital devices → digital project unit
- all classrooms equipped with digital whiteboards
- all police officer trainees received convertibles and smartphones
- two ways of using the convertible:
 - a) digital device as learning medium (e.g. taking lecture notes, looking things up on the internet, preparing for exams, but also conducting their exams with the convertible, video-conferencing)
 - b) digital device as operational tool (e.g. taking a sketch of a traffic accident, using an app for identification) and preparing for duty after the police training
- Strong political interest and support for the “Bavarian way”



Source: Bavarian Police, 2021



Empirical Findings¹

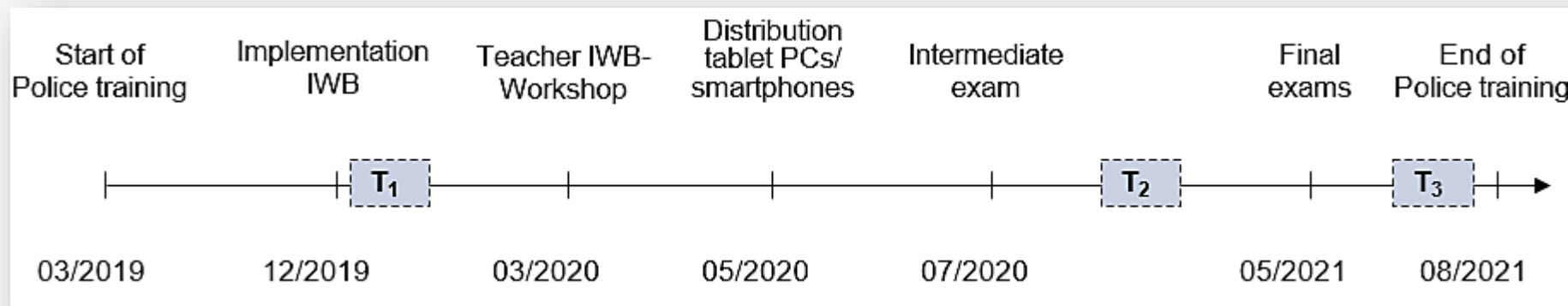


¹The following findings were published in April 2022 in *Police Practice and Research: An international Journal*: Micha Fuchs (2022). Digital equipment – a game changer for police training?! Experiences of the Bavarian Police training. In: *Police Practice and Research*, [DOI: 10.1080/15614263.2022.2067157](https://doi.org/10.1080/15614263.2022.2067157).

Method – Research design

- Period: **December 2019 to July 2021**
- Participants: **99 police officer trainees**, 29% female, age Ø 22 years old
(= one organisational unit)
- Intervention: **all five classrooms** were equipped with **interactive whiteboards** (IWB), all **police officer trainees** and police teachers **received a convertible & smartphone in May 2020**; **introductory workshops** were held for each digital device
- Method: standardised questionnaire
- Points in time: **T₁ January 2020**, end of 2nd term, before first COVID-19-lockdown
T₂ November 2020, 4th term, before the second internship (12 weeks)
T₃ July 2021, end of 5th term, after the final exams

Important to keep in mind:
The entire project took place during the COVID-19 pandemic





Method – Instrument/Measures

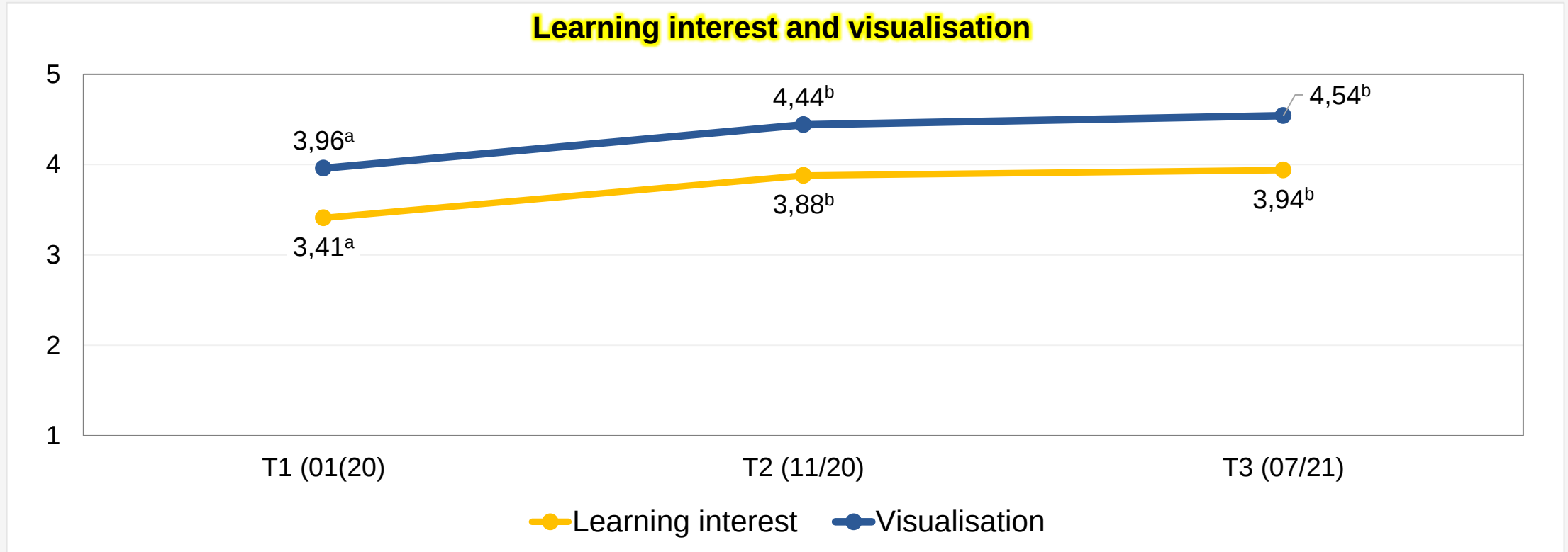
Student engagement	3 items were asked on a 5-point Likert scale ranging from 1 (negative) via 3 (neutral) to 5 (positive) for tablet PCs and smartphones, e.g. “Using my tablet PC during class has influenced my active participation”.
Learning interest	was measured with two items “Using the digital device during class helps me to develop a greater interest in learning” and “Using the digital device motivates me and raised my interest” using a 5-point Likert scale
Frequency of usage behaviour	a) scale 1 classroom-related behaviour b) scale 2 field-related behaviour } 5-point Likert scale (1 = never; 3 = several times a week; 5 = several times a day)
Visualisation of teaching content	5-point Likert scale from 1 (negative) to 5 (positive) with three items (e.g. “The use of the interactive whiteboard has changed the visualisation of the teaching content in class.”)
Academic performance	Comparison of the a) written midterm exams in July 2020 and b) the results of the written final exam in May 2021 between the digital project unit (N = 99 police trainees) and five other organizational units (N = 629)
Mobile devices as operational tools	5-point Likert scale from 1 (negative) to 5 (positive), e.g. “The use of the tablet PC has improved my practical competence in using the tablet PC as an operational device”.
Future teaching and learning material	Rating of the future importance of traditional (e.g. books, worksheets) and digital teaching and learning materials (e.g. tablet PC, videos) in the classroom on a 10-point scale from 1 (very unimportant) to 10 (very important)

Interactive whiteboard

Findings 1



Influence of the **interactive whiteboard** on learning interest and visualisation of teaching content



Scale: 1 = negative; 3 = neither negative nor positive; 5 = positive

Note: Results with different code letters (a, b) differ significant on a 5%-level between measurement time points

→ The use of the interactive whiteboards immediately and sustainably increased the learning interest as well as the visualisation of the teaching content.

Mobile devices

Findings 2

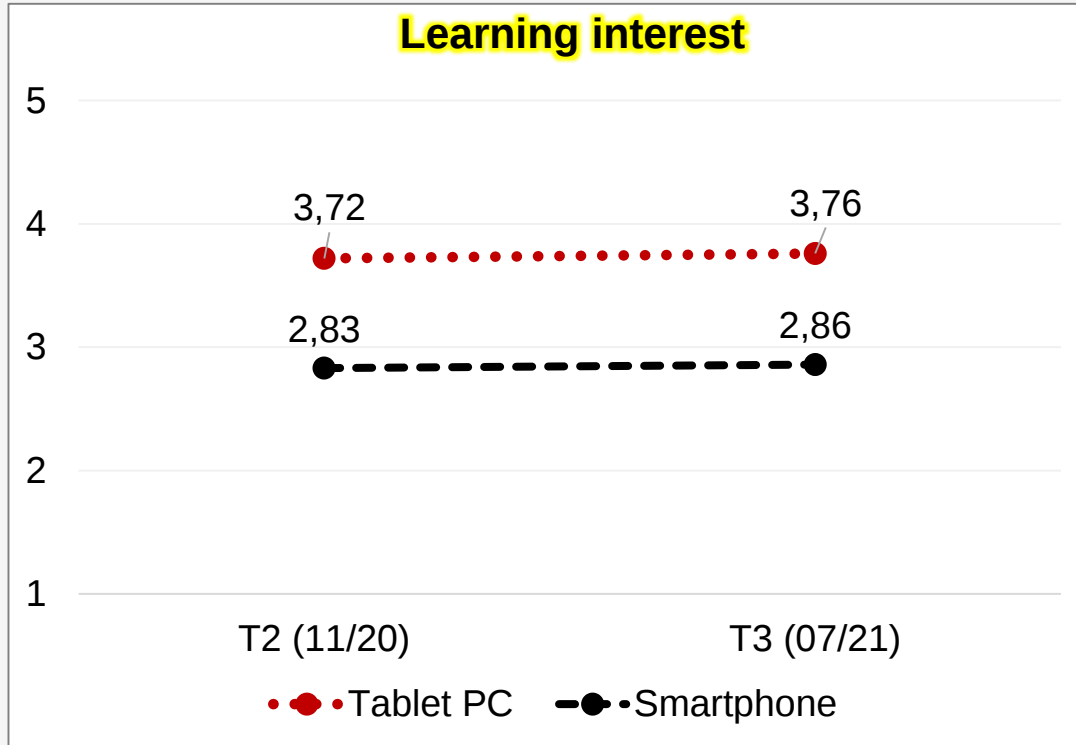


Figure 2. The influence of digital devices on learning interest and engagement between T_1 and T_3

Scale: 1 = negative; 3 = neither negative nor positive; 5 = positive

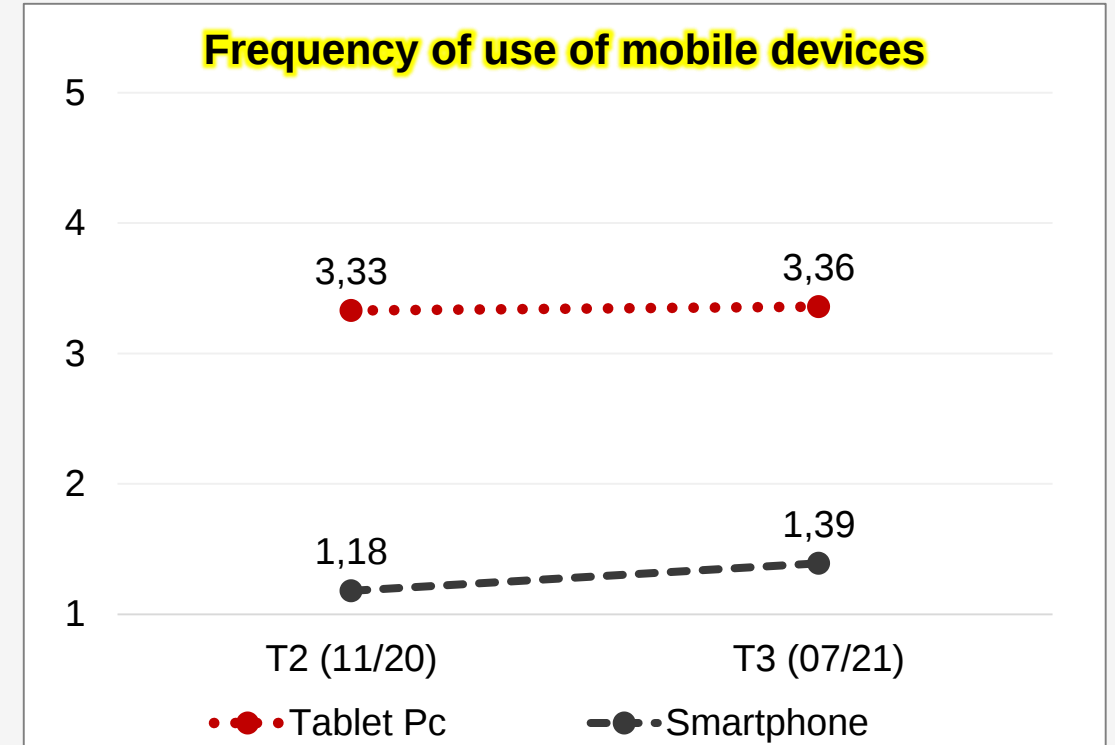


Figure 3. The frequency of use of mobile devices during the measurement points T_2 and T_3

Scale: 1 = never; 3 = several times a week; 5 = several times a day

- an overall positive influence of the tablet PCs on the learning interests of the police officer trainees
- no influence of the smartphone on learning interest and only sporadic use of smartphones

Relationship between **frequency of use of mobile devices** in relation to **learning interest and engagement** of police officer trainees in terms of different usage behaviour.

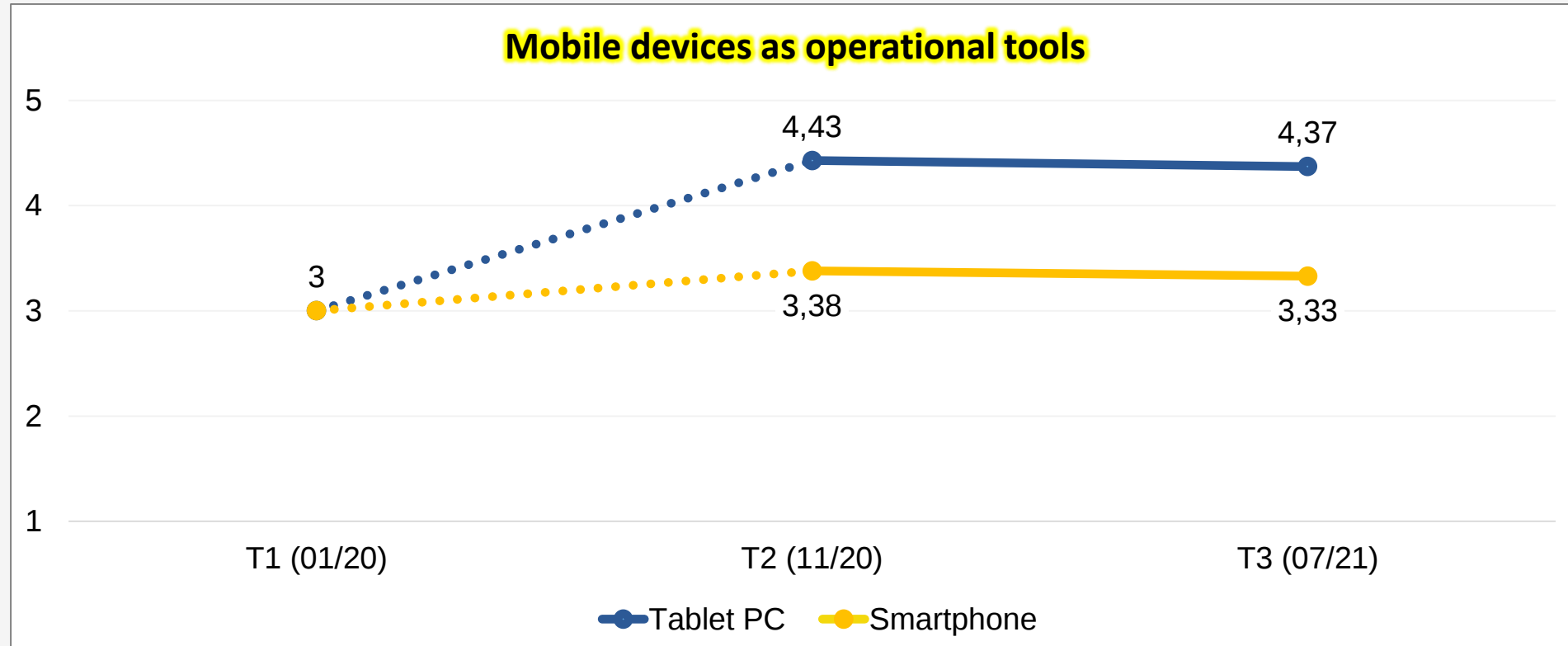
	(1) Overall intensity use	(2) Intensity classroom behaviour	(3) Intensity service- related behaviour	(4) Learning interest	(5) Engagement/ activation
Tablet PC					
(1) Overall intensity use	-	.89**	.89**	.51**	.44**
(2) Intensity classroom behaviour		-	.58**	.53**	.49**
(3) Intensity service-related behaviour			-	.37**	.29**
(4) Learning interest				-	.87**
(5) Engagement/activation					-
Smartphone					
(1) Overall intensity use	-	.91**	.92**	.10	.12
(2) Intensity classroom behaviour		-	.68**	.07	.10
(3) Intensity service-related behaviour			-	.10	.12
(4) Learning interest				-	.97**
(5) Engagement/activation					-

Note: ** = $p < .01$

→ Positive correlation between frequency of use of the convertible and learning interest as well as active participation of police officer trainees in lessons

Mobile devices

Findings 4



Scale: 1 = negative; 3 = neither negative nor positive; 5 = positive

Tablet PCs: the t-test shows no significant change over the course of the project, $t(159) = .053$, $p > .05$, $d = -0.09$
Smartphones: no significant time trend ($t(159) = .38$, $p > .05$, $d = -0.06$)



Academic performance – Project unit vs. reference units

Descriptive statistics between the **project unit** and its **reference units** in terms of grade points for the **midterm examination and the final written examination**.

		N	M (SD)	Median	Min	Max
Midterm exam	Project unit	93	9.23 (1.95)	9.50	5.50	12.75
	Reference units	629	9.09 (1.85)	9.00	4.25	13.50
Final written exam	Project unit	92	8.77 (1.67)	8.94	5.12	12.75
	Reference units	617	8.83 (1.83)	8.75	4.00	13.62

Note: Grading scale: 0.00-1.99 $\triangleq$ very poor (fail), 2.00-4.99 $\triangleq$ unsatisfactory (fail), 5.00-7.99 $\triangleq$ satisfactory, 8.00-10.99 $\triangleq$ good, 11.00 -13.49 $\triangleq$ very good, 13.50-15.00 $\triangleq$ excellent

The t-tests showed no significant difference between both groups:

Midterm exam: $t(720) = 0.70$, $p = .48 > .05$, $d = 0.08$

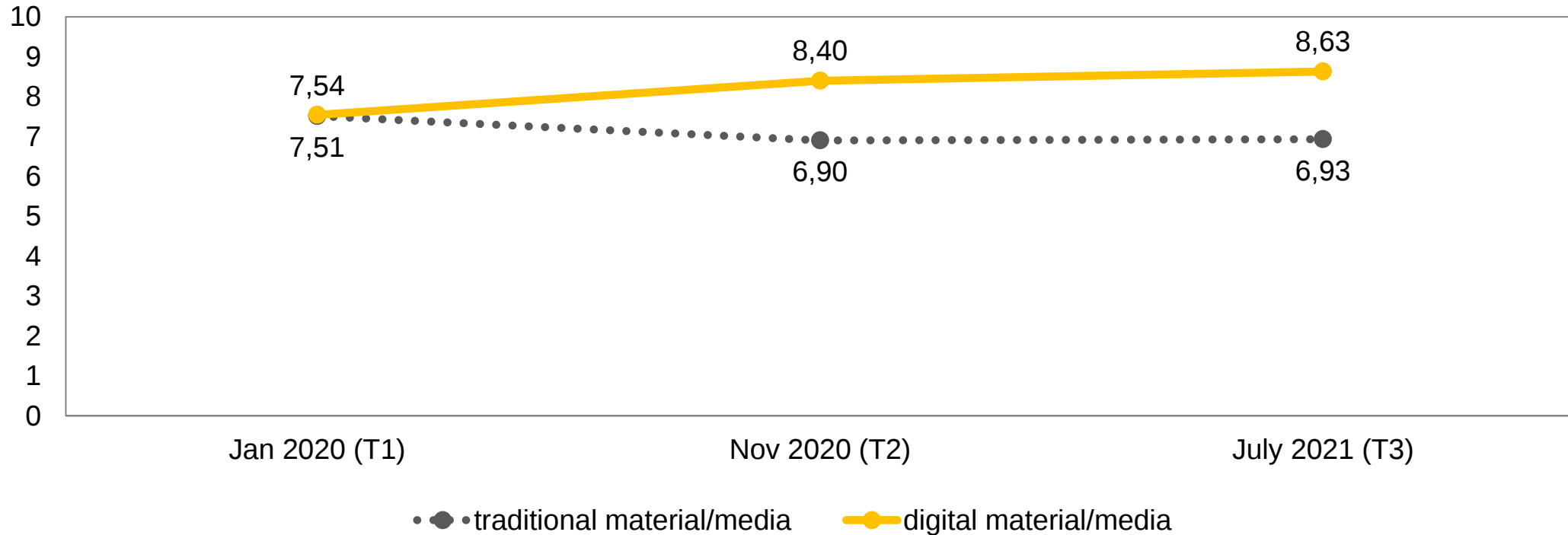
Final exam: $t(707) = -0.29$, $p = .77 > .05$, $d = 0.03$

Findings 6

Traditional vs. digital teaching & learning material



Importance of the future teaching and learning materials in the classroom



*Assessment of the importance of future teaching and learning materials in the classroom over the course of the digital pilot project.
Scale: 0 = very unimportant to 10 = very important*

**The importance of digital teaching and learning materials in the classroom increases continuously
→ The young police officer trainees want to learn with digital teaching and learning material**



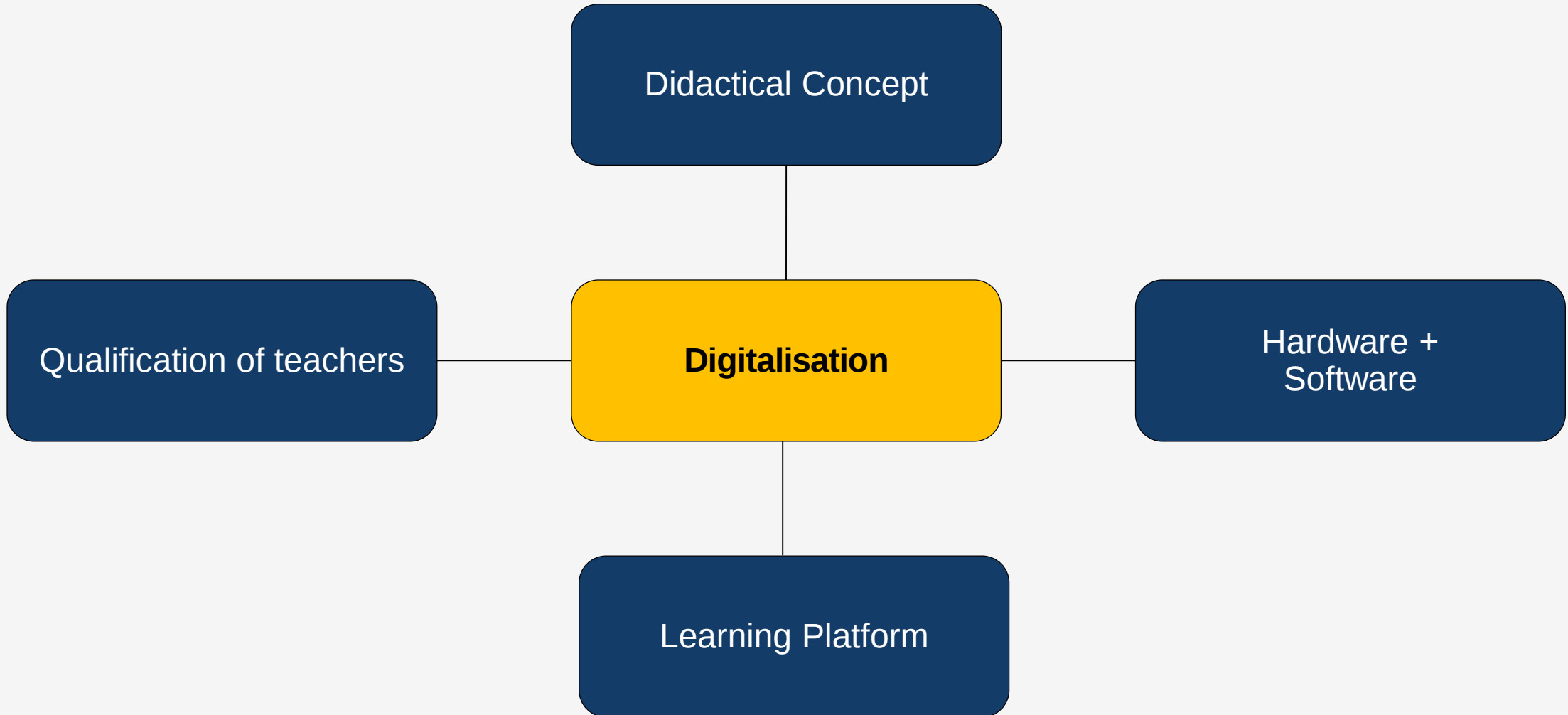
- The use of digital whiteboards and convertibles can directly support and improve police training in terms of teaching and learning settings.
 - Smartphones are only used sporadically, so their use needs to be better trained and explained.
 - The empirical findings showed no significant difference between the digital project unit and the reference organizational units
(but we must bear in mind that the COVID-19 pandemic occurred with all its consequences, e.g. closure of police academies, home schooling)
- Final conclusion: Although there is still a long way to go before digitalisation is fully (and successfully) implemented in the Bavarian police, we are no longer discussing *whether*, but only *how* we want to proceed.



Practical implications

1. **Qualification** and training **for teachers** and **instructors** play a **key role** in integrating technology into teaching and practical training. In addition, the training courses should have a high practical relevance, where the various digital devices (above all the use of smartphones) can be actively tried out.
2. **Hardware** (digital devices) and **software** (e.g. learning management system (LMS)) as well as the **technical infrastructure** must **function properly** to ensure acceptance by police teachers and trainees.
3. An **LMS in the police network** is necessary to be able to use all teaching and learning material.
4. **Learning** and **teaching materials** need to be adapted to the *new* learning and teaching context (e.g. **more gamification**), therefore new forms of learning and teaching material need to be created e.g. **interactive videos, quizzes**, wikis, learning modules.
5. To improve teaching and learning in combination with digital devices and to meet the requirements of the new generation of police officer trainees, **new teaching forms** such as just-in-time teaching and **flipping the classroom** should be tried.

The Bavarian way to face digitalisation in basic police training





How do we proceed?

- Scientific cooperation-project with the Ludwig-Maximilian-University Munich from April 2022 to March 2025 (a whole course of police training)
- Following issues will be addressed:
 - benefits and constraints in teaching and learning due to full digital equipment
 - what are the factors of success for sustainable learning on the part of teachers?
 - how can the potential of digital devices and media support the social competences of the police officer trainees?
 - changes and effects of digital media for training and everyday police life in the short-term perspective (e.g. in internships) and in the long-term perspective (in regular police service).



For further information and questions:

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