



LEAPS



From Hype to Reality: The Promise and Challenges of Educational Technology in Practice

Insights from Targeted Instruction Program (TIP) in KP

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FCDO

A Way Forward: Targeted Instruction in Pakistan

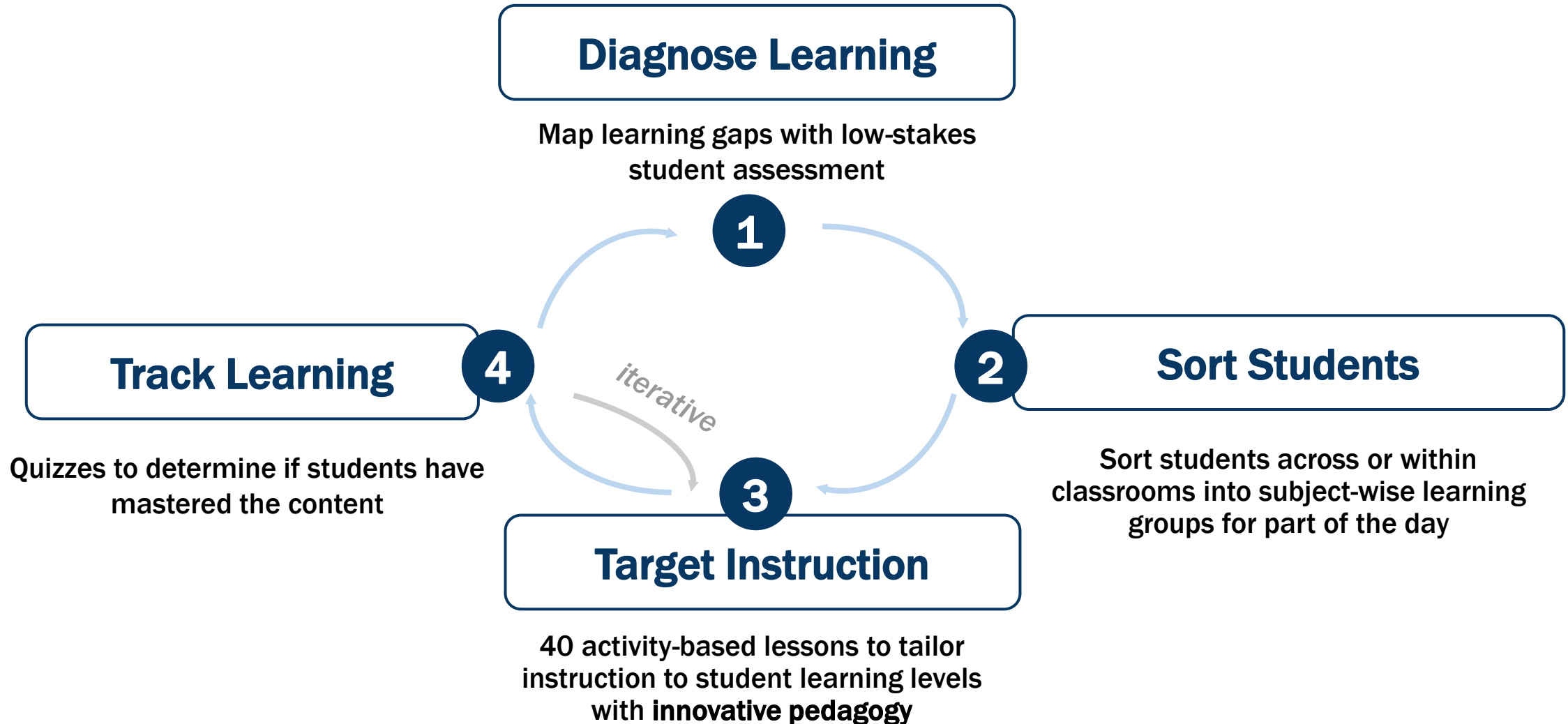
We, at CERP, designed a contextualized, system-aligned foundational program to *fill in gaps in students' foundational skills*.

Targeted Instruction in Pakistan (TIP)

A foundational learning program to support existing teachers, through a low-cost technology software, in helping primary students (grades 1-5).

- **Direct COVID education response** to mitigate learning losses
- **Integrate closely with government priorities** around curriculum, teacher training, and learning
- **Build students' foundational skills** to make regular classes more productive
- **Minimize costs** by leveraging existing technology devices (personal smartphones and tablets) to support administration

TIP Intervention: 40 days of *targeting* and *tracking* students



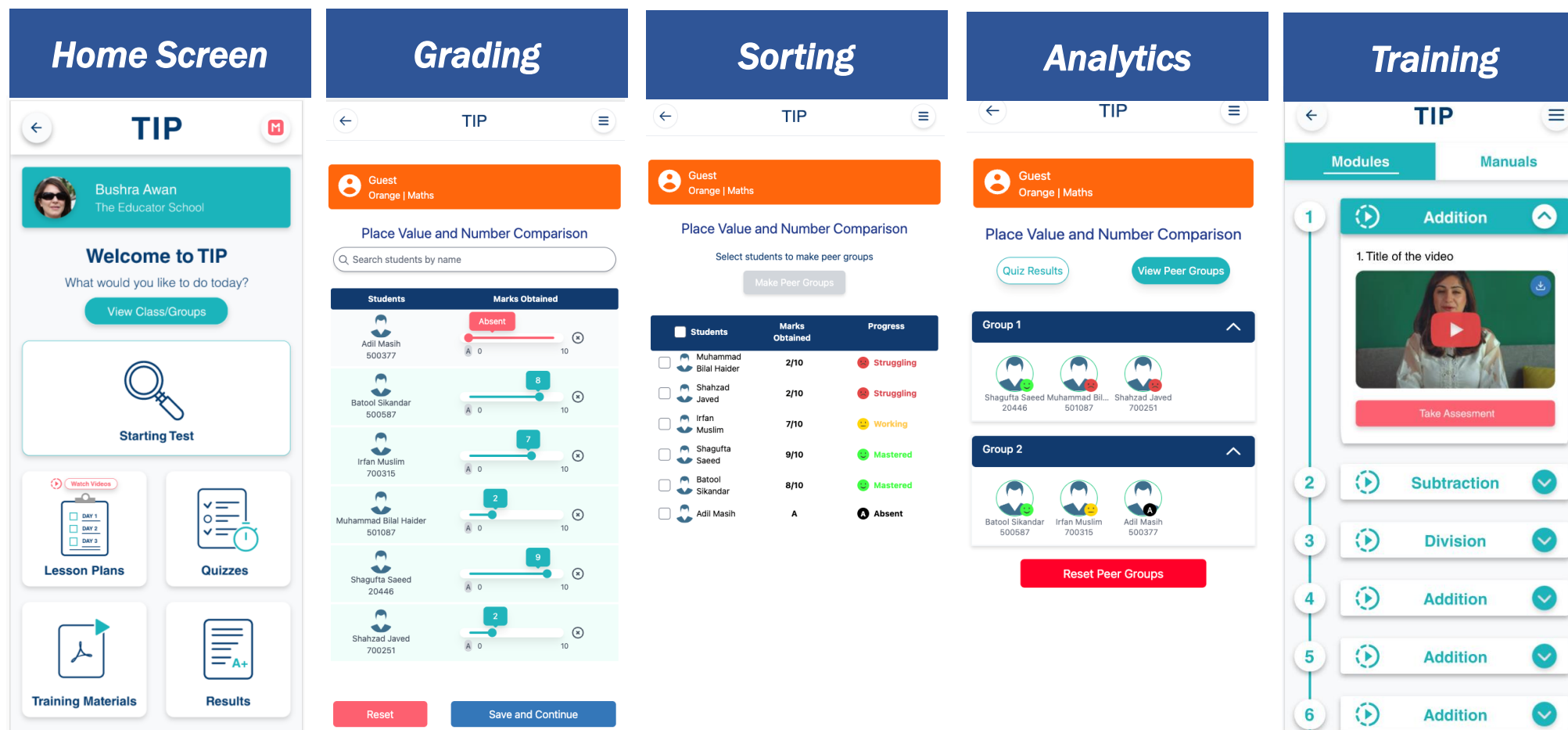
Minimize costs by leveraging **existing technology devices** to support teachers through a software

TIP Research Sample

	Study 1	Study 2
Location	2 districts in KP	ICT
Schools	1250 public primary schools	560 public primary schools
Teachers	~7000 teachers and head teachers	2500 teachers and head teachers
Students	~250,000 from classes 1-5	~90,000 from classes 1-5
Household actors	NA	10,000

TIP Tech Tool: MIS, LMS and Fast Grading Tool

Through an iterative process, we developed a *teacher-support Tech Tool* with a toolkit consisting of an adapted curriculum and related instructional materials, a grading tool, and asynchronous training resources.



TIP Tech Tool: MIS, LMS and Fast Grading Tool

Minimize costs by leveraging **existing technology devices** to **support teachers**

Features of the TIP Tech Tool

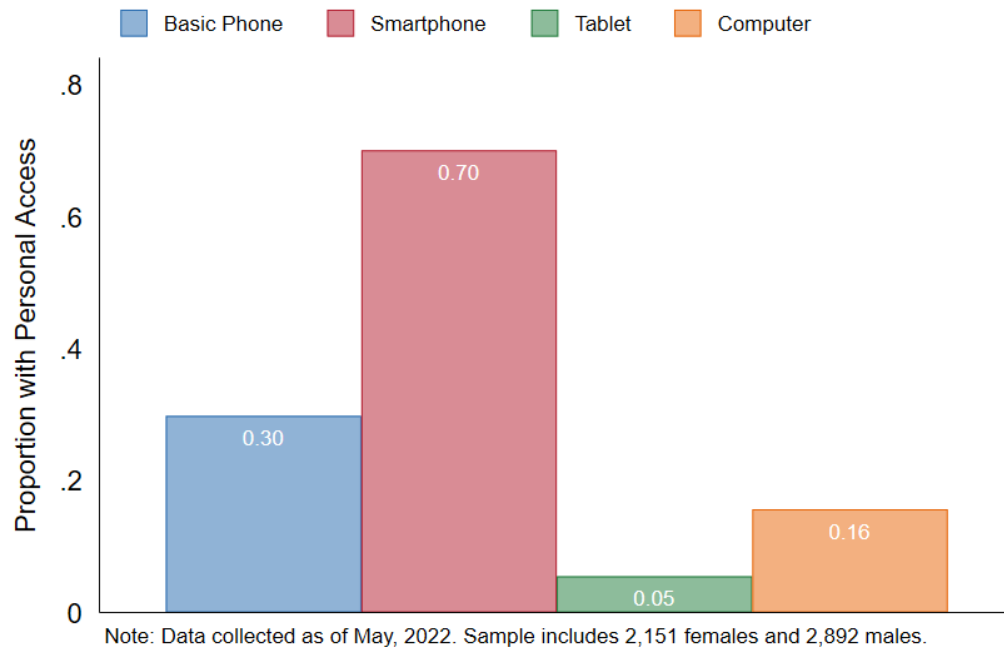
- Assists teachers in efficiently grading students
- Generates child-, class- and skill-wise student results
- Sorts students into learning and peer groups to target instruction to individual students
- Cues readily available, downloadable lesson plans and related TLMs for targeted instruction
- Offers training videos, focused on pedagogy and content, in downloadable and online formats
- Systematically organizes school, teacher and student level data

Alleviating teachers' constraints in tech adoption

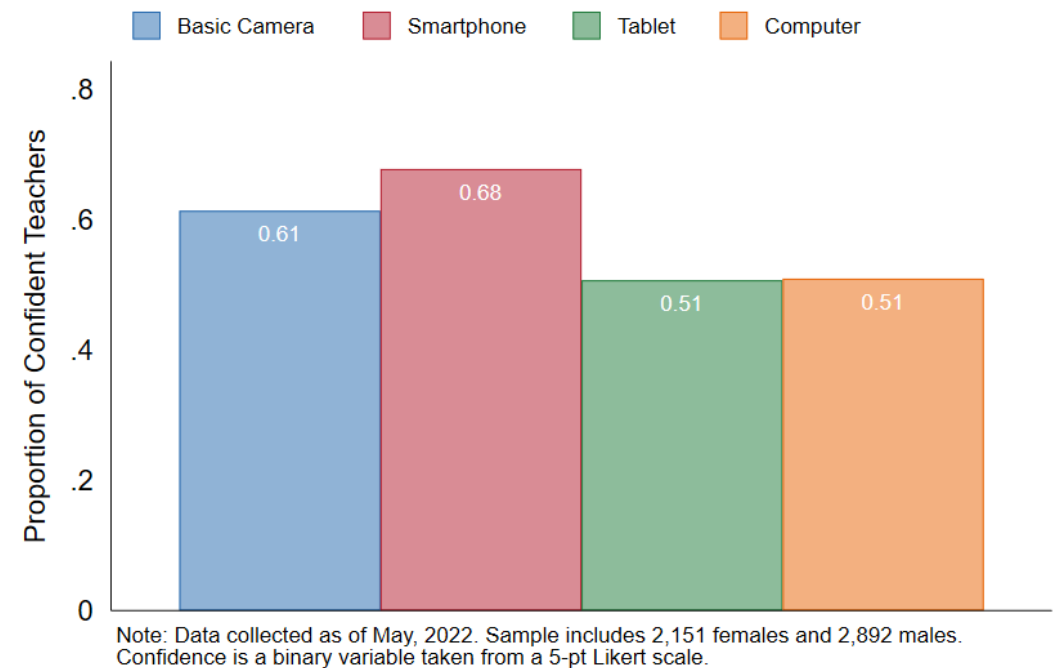
TIP is designed as a scalable and sustainable solution for budget-constrained settings.

- A low-cost technology software, built using WhatsApp UI/UX interface, that can be used offline once downloaded on *existing smart devices*.
- *Smartphones as the instrument of choice*, given its high prevalence and comfort among teachers as a personal digital device.

Teachers' Access to Digital Devices



Teachers' Confidence in Digital Devices



TIP KP: Research Design

Treatment Groups Allow Us to Test...

Targeted Instruction

1. No technology (paper-based)
2. Mandatory technology
3. Optional technology
4. Mandatory, then optional tech (grace period)

Tech vs. paper-based TIP (T1 vs. T2-T4) to examine how teacher tech adoption impacts TIP implementation and student learning.

Is tech an *experience good*? Varying exposure and mandated usage policy.

No Targeted Instruction

5. No targeted instruction (pure control)

TIP as a whole (T1-T4 vs. T5) to test the efficacy of our targeted instruction program as a whole.

TIP KP: Research Design

Targeted Instruction

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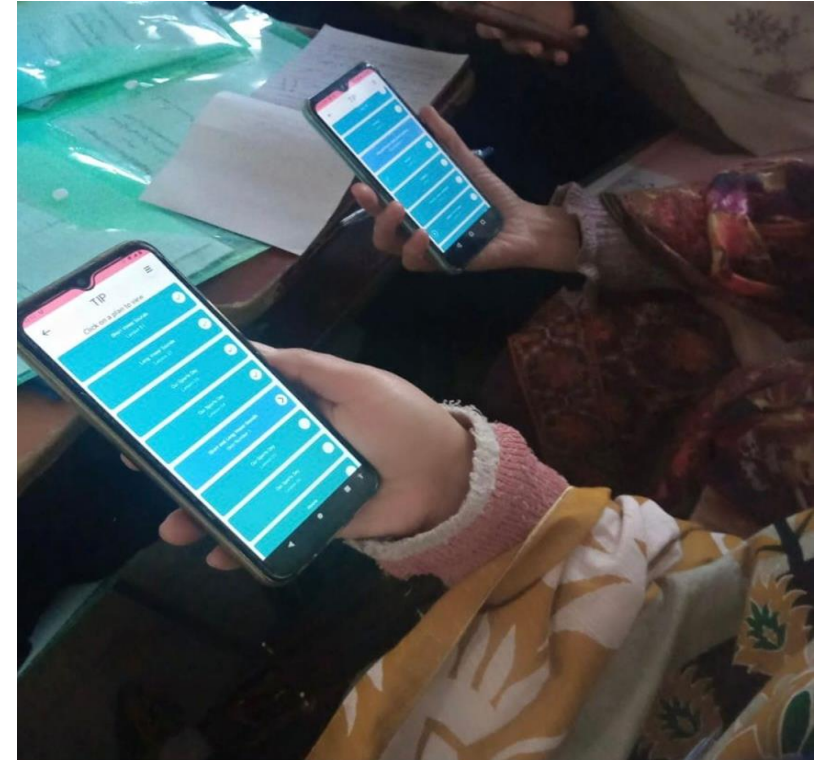
No Targeted Instruction

5. No targeted instruction (pure control)

We focus on teachers' choices in T3 and T4.

T3 allows people to self select into the technology tool.

We know women have less confidence in technology. In T4, we first mandate exposure to the tech tool for 2 weeks, then we allow them to opt out / keep and see whether they differ vs. optional treatment arm.



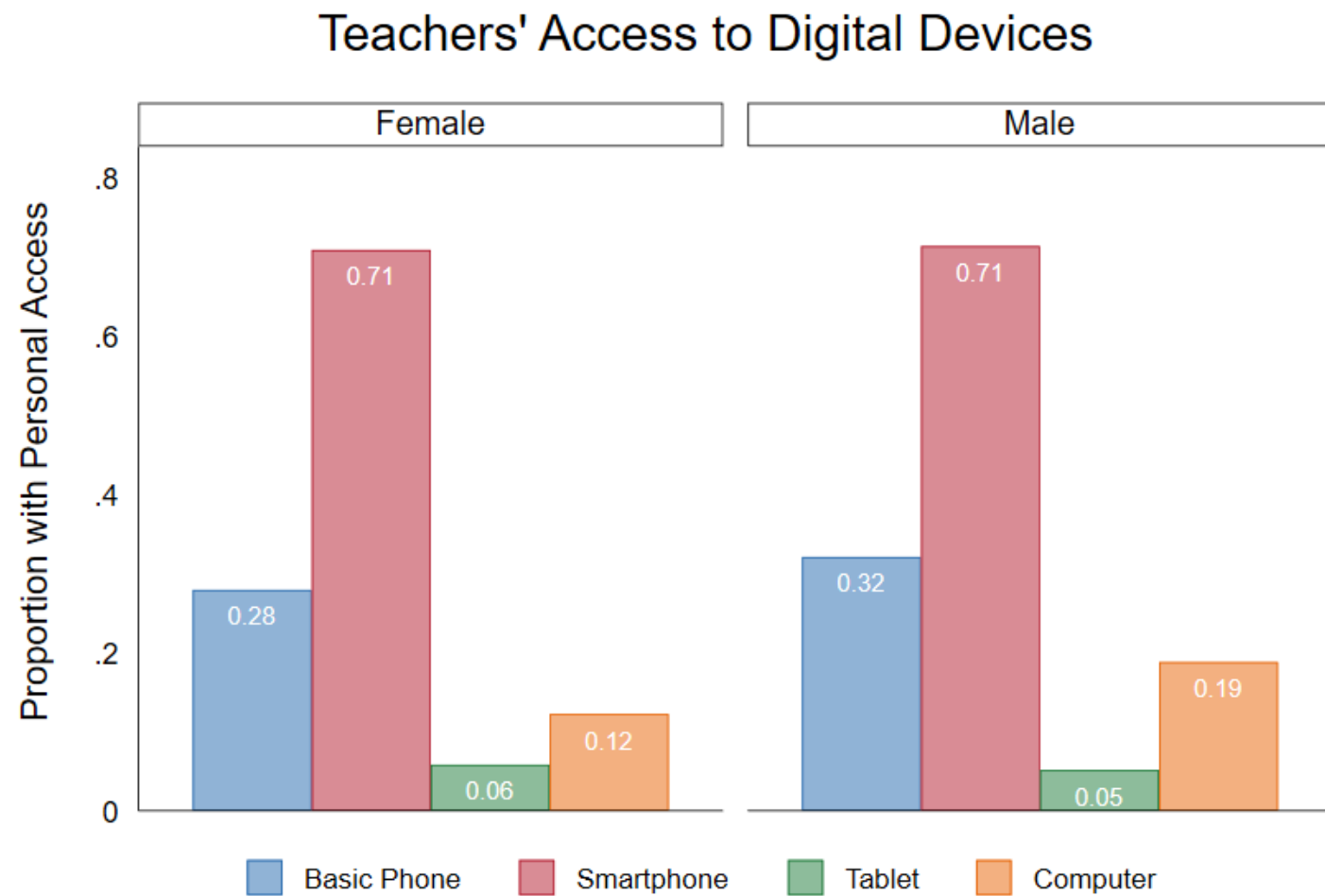
Heterogeneity in Teachers' Access and Confidence in Technology

Dataset: Teacher Baseline Survey

- Teacher Baseline Survey
- Date(s) collected: May 2022
- Unit of observation: teacher-level
- N=6,833 public primary teachers across all treatments

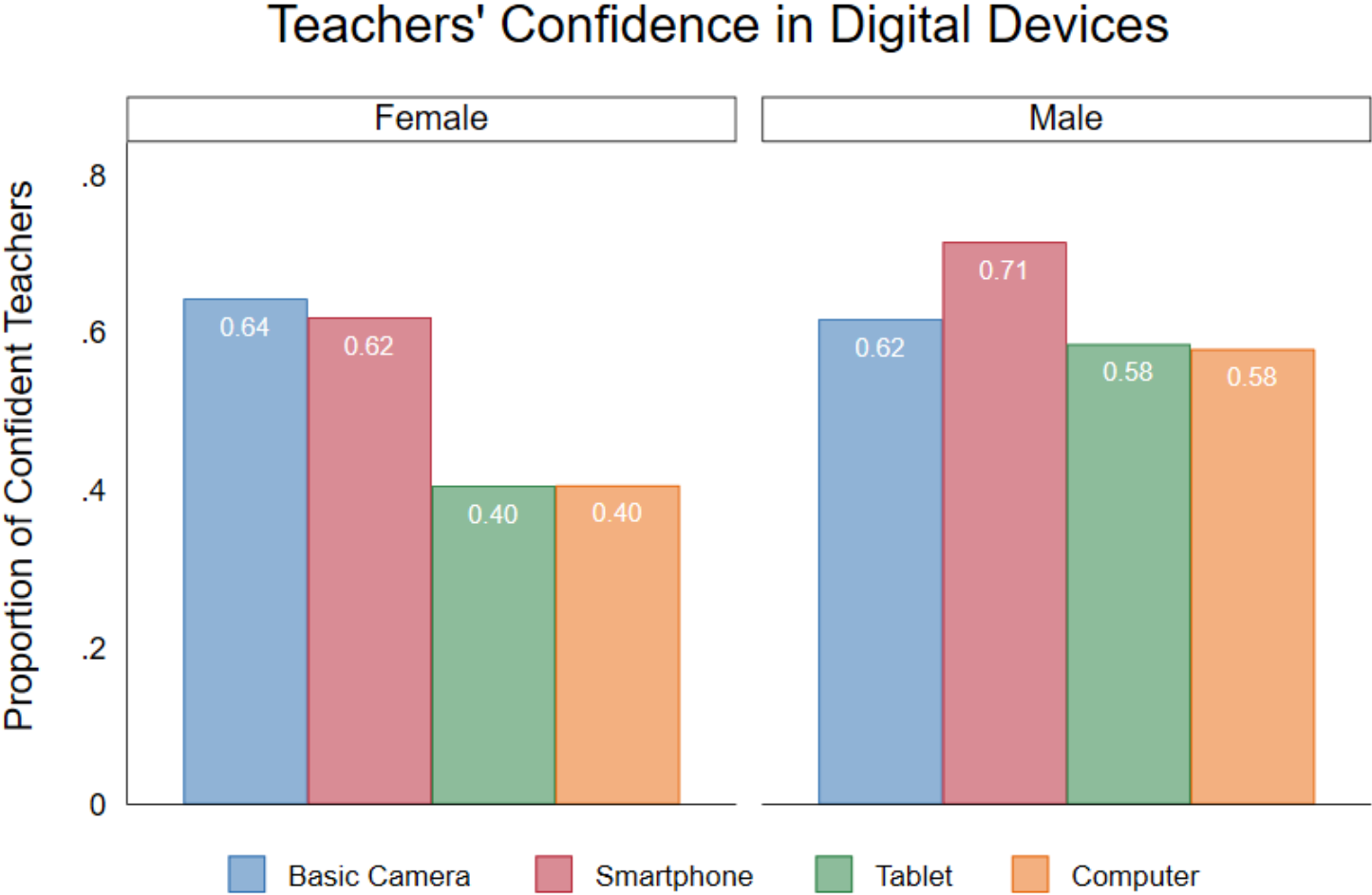
Sections
Section 1 Teaching experience, training, commute, personality Section 2 Technology confidence and usage Section 3 Time allocation in-class vs. outside-class, pedagogy styles Section 4 Beliefs about pedagogy styles and TIP's effectiveness

Female and male teachers have **similar access** to smartphones.



Note: Data collected as of May, 2022. Sample includes 2,151 females and 2,892 males.

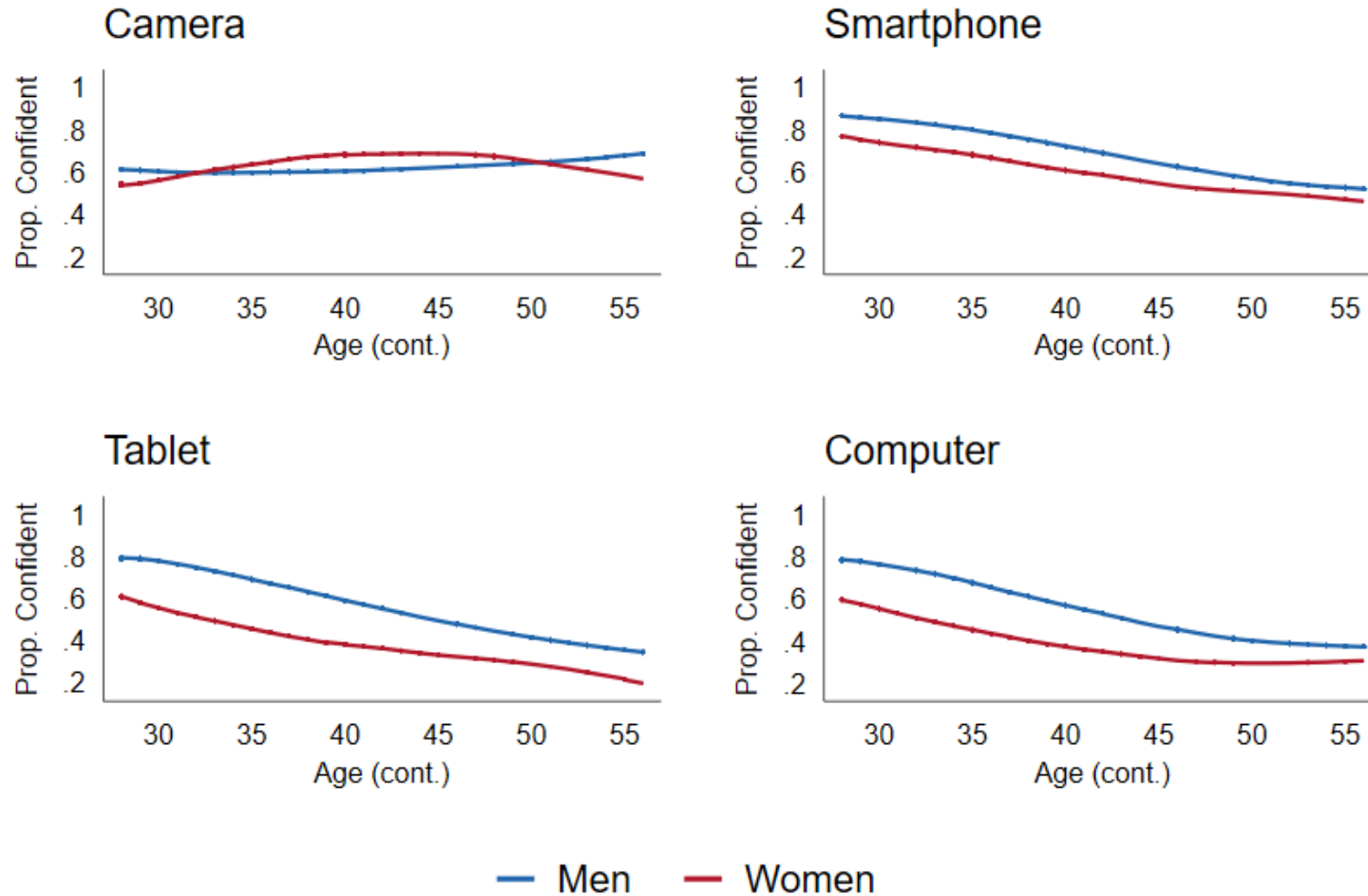
However, men are significantly **more confident** in all devices except basic camera.



Note: Data collected as of May, 2022. Sample includes 2,151 females and 2,892 males. Confidence is a binary variable taken from a 5-pt Likert scale.

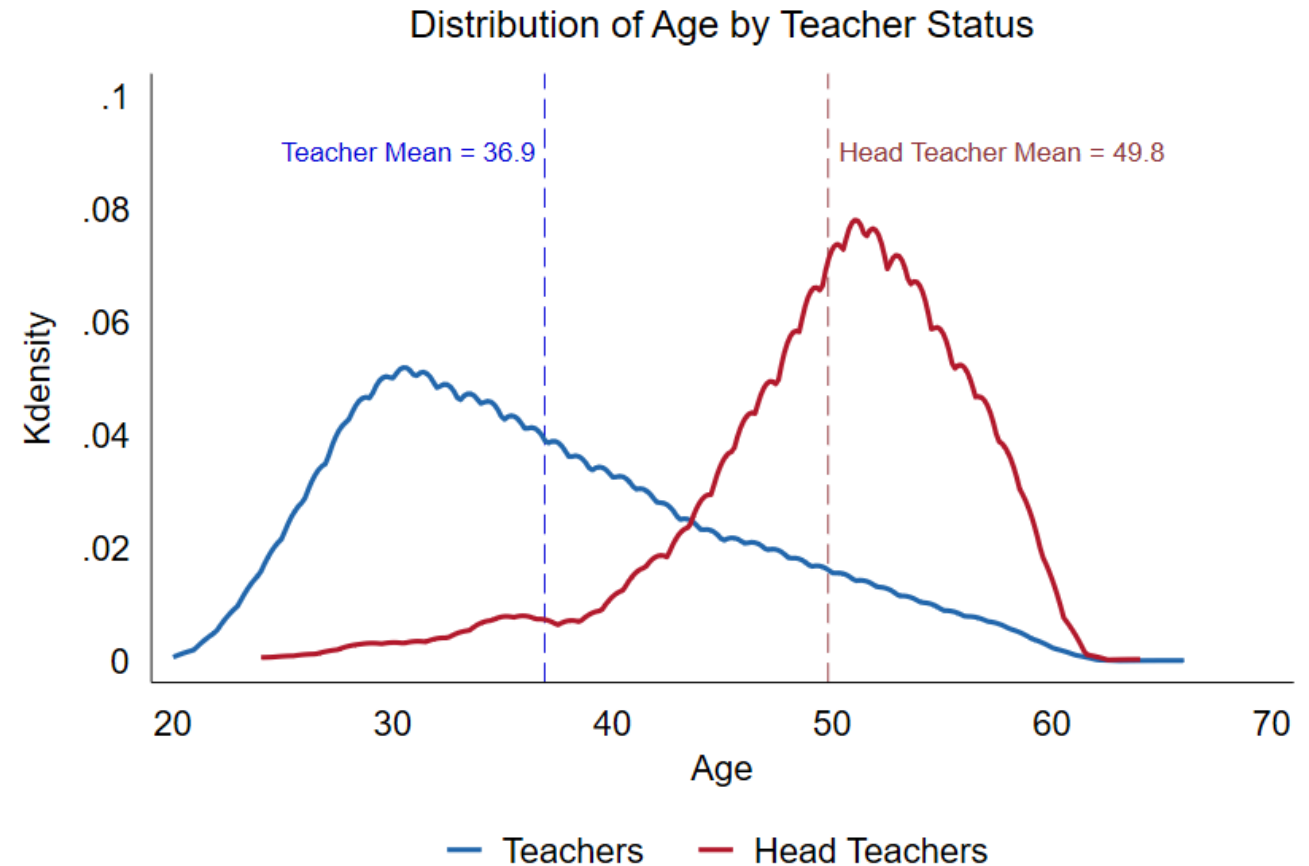
Across ages, men are mostly more confident in digital devices than women are.

Teachers' Age and Confidence in Digital Devices



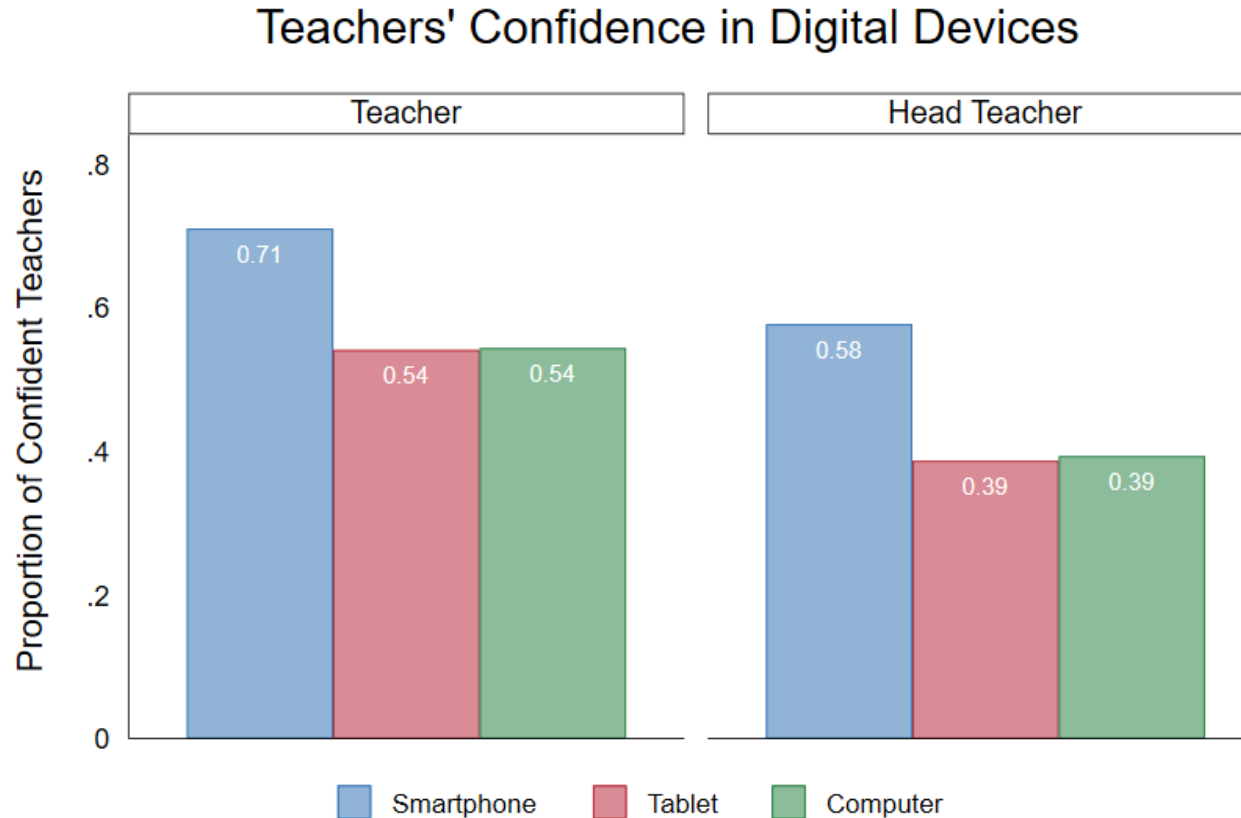
Head teachers are *older* ...

- Head teachers are much older than teachers (+ 13 years)
- These *older* head teachers display different technology preferences and beliefs



Note: Latest collected as of January, 2023. Sample includes 5,608 teachers and 1,232 head teachers.

... and *less comfortable with technology*

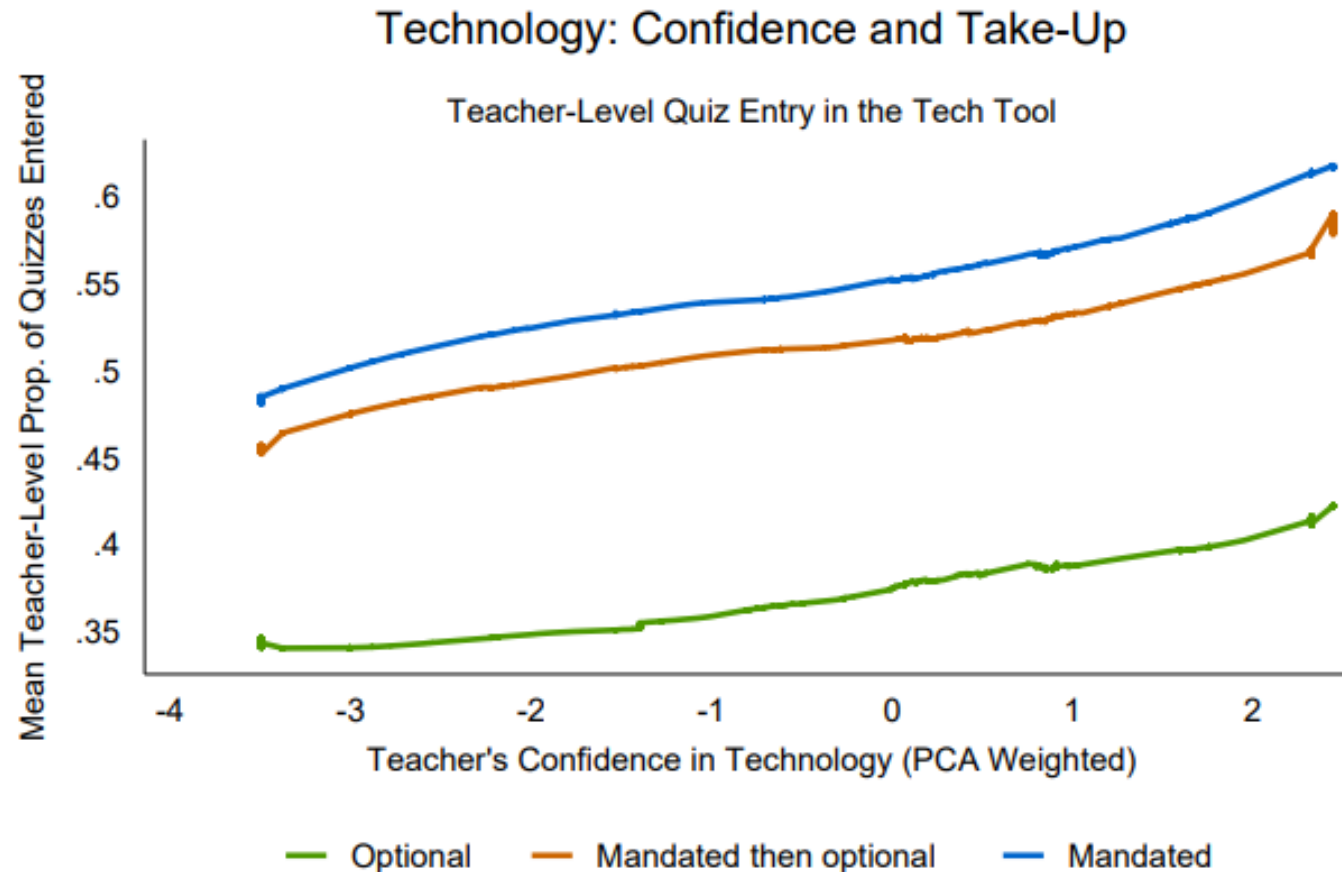


Note: Data collected as of May, 2022. Sample includes 5,608 teachers and 1,232 head teachers. Confidence is a binary variable taken from a 5-pt Likert scale.

TIP leverages ***Tech Captains***, a chosen/self-volunteered teacher in the school, to reinforce tech take-up of the tech tool by teachers, especially older ones.

Preliminary Results: Teacher Take-Up of Technology

Technology take-up is correlated with *ex ante* confidence in technology



Notes: Lines show the local estimates of OLS regressions of tech take-up on PCA-weighted technology confidence. Technology confidence is a PCA-weighted teacher-level average of dummies measuring confidence in smartphone, camera, computer, etc. Tech take-up is measured by teacher-level means of total graded quizzes across subjects on the tech tool. Sample includes teachers N=863 in optional, N=787 in mandated then optional, and N=805 in mandated tech treatment arms. Sample excludes teachers or students who transferred away or into sample schools during TIP administration. In the mandated then optional tech treatment arm, the opt-out announcement was made to schools 4 weeks after the start of TIP classes. Optional tech schools were told to use the tech tool at their discretion from the start of TIP classes. Mandated tech schools were required to use the tech tool throughout TIP classes.

TIP KP: Research Design

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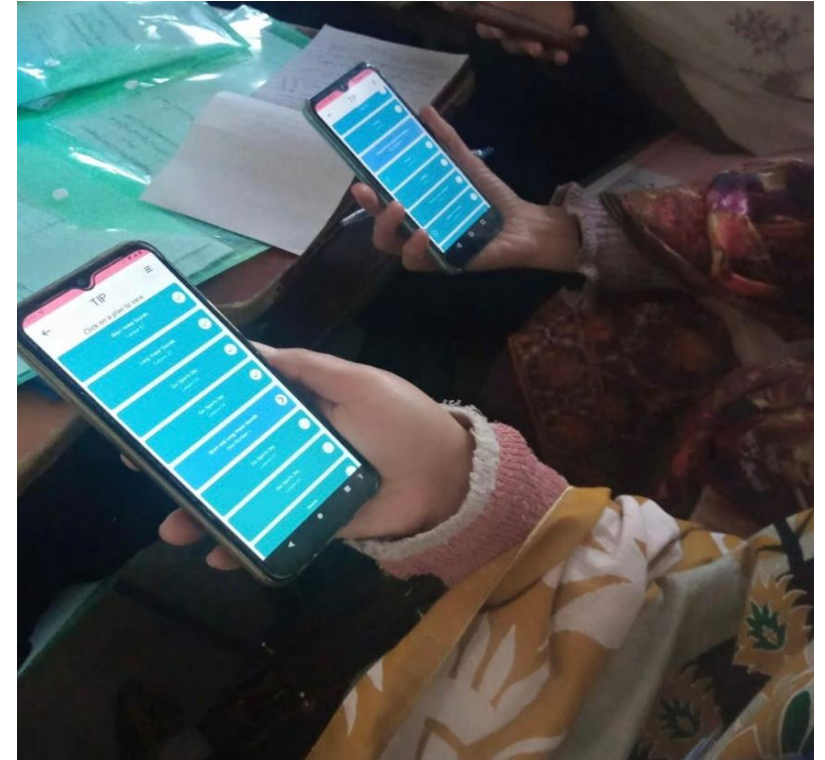
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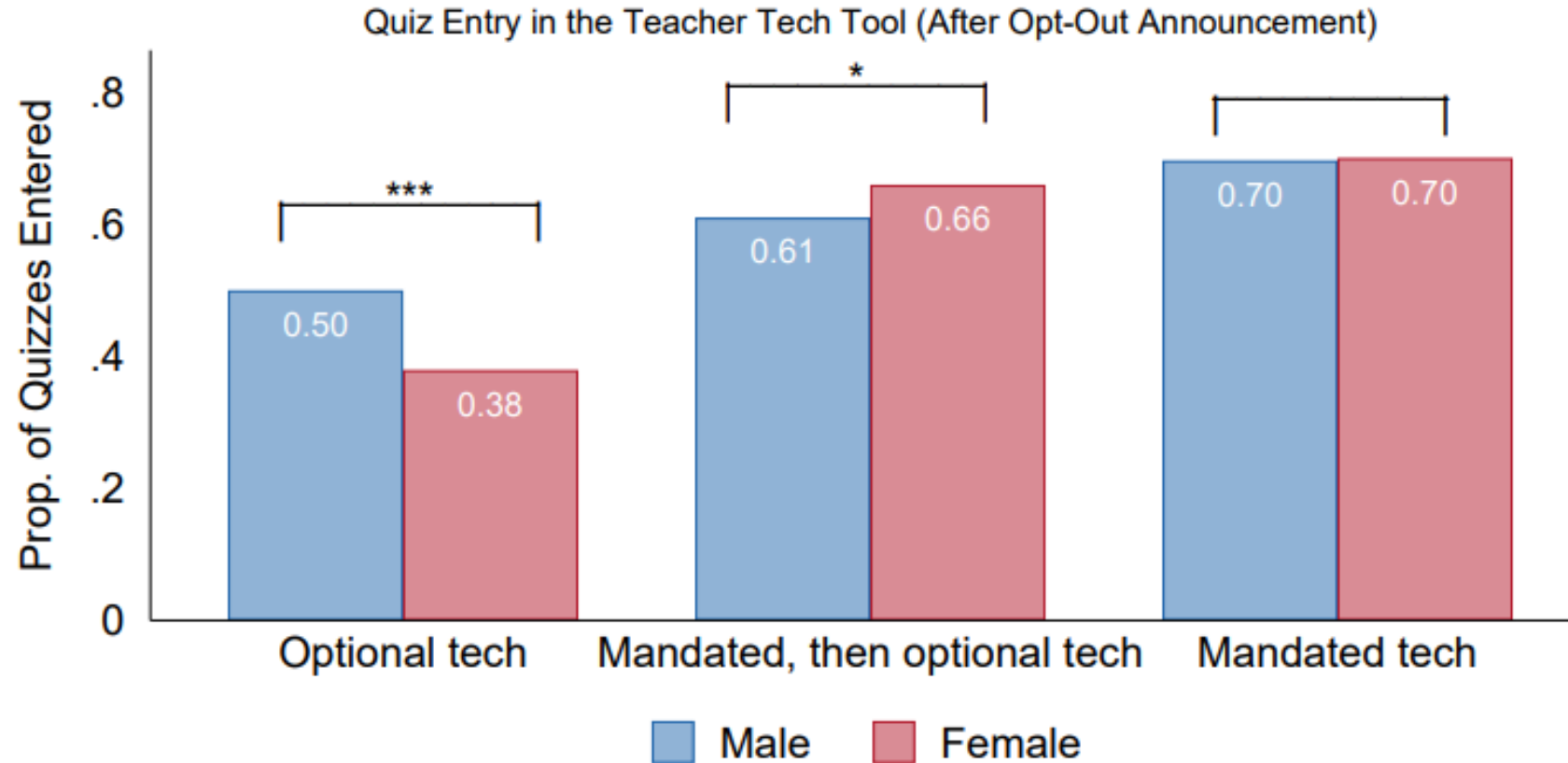
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T3 allows people to self select into the technology tool.

We know women have less confidence in technology. In T4, we first mandate exposure to the tech tool for 2 weeks, then we allow them to opt out / keep and see whether they differ vs. optional treatment arm.

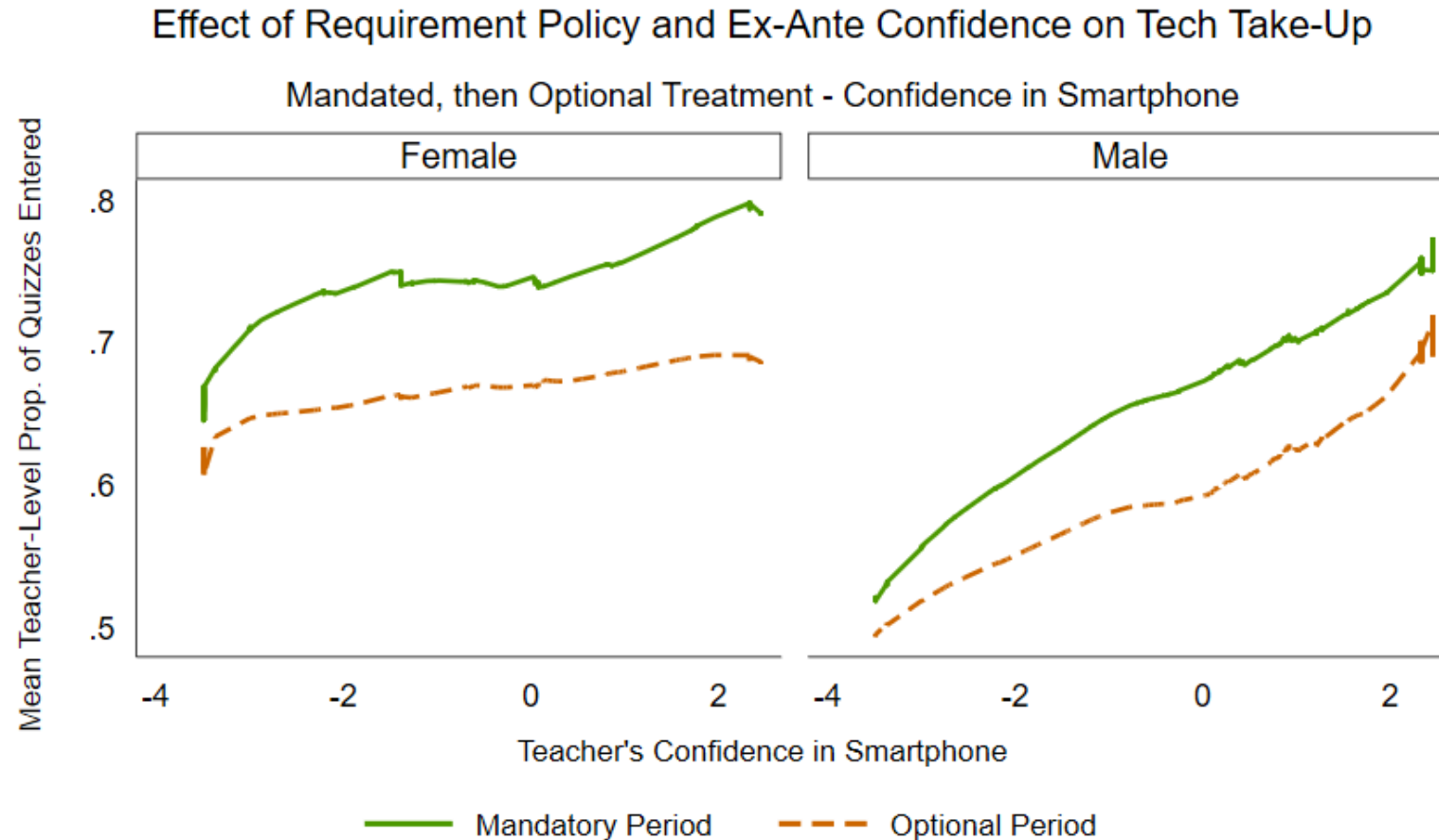


Getting over the confidence gap: women are *more likely to use the technology tool* after being mandated to do so



Note: Stars indicate significance in the difference in gender means at the 5% **, 1% **, and 0.1% *** levels. Bars show treatment means (by gender) of teacher-level means of total graded quizzes across subjects on the tech tool. Sample includes teachers N=1,019 in optional, N=931 in mandated then optional, and N=964 in mandated tech treatment arms. Sample excludes teachers or students who transferred away or into sample schools during TIP administration. Overall treatment means after the opt-out announcement are 0.45 in optional, 0.63 in switch, and 0.70 in mandated schools. Proportion of men is ~60% and is not significantly different across treatments. In the mandated then optional tech treatment arm, the opt-out announcement was made to schools after 2 quizzes (or 4 weeks after the start of TIP classes). Optional tech schools were told to use the tech tool at their discretion from the start of TIP classes. Mandated tech schools were required to use the tech tool throughout TIP classes.

Getting over the confidence gap: women are *more likely to use the technology tool* after being mandated to do so

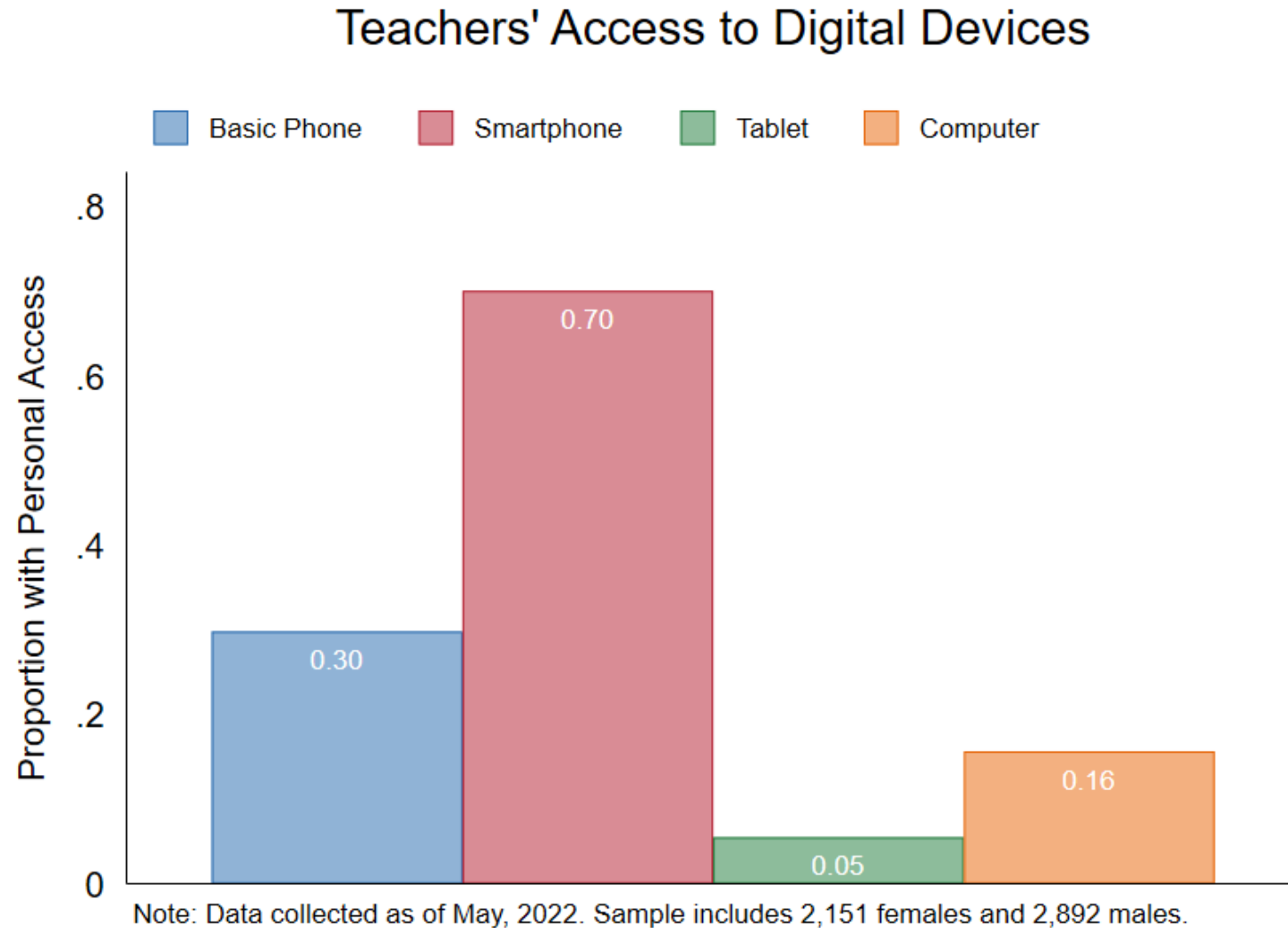


Notes: Lines show the local estimates of regressions of tech take-up on confidence.
Confidence is measured on a 1-5 Likert scale (1-Very confident; 5-Not at all confident.)
Tech take-up is measured by teacher-level means of total graded quizzes across subjects on the tech tool.
Sample includes teachers N=1,019 in optional, N=931 in mandated then optional, and N=964 in mandated tech treatment arms.
Sample excludes teachers or students who transferred away or into sample schools during TIP administration.
Overall treatment means during trial are 0.70 during mandatory period, and 0.63 in optional period.
In the mandated then optional tech treatment arm, the opt-out announcement was made to schools after 2 quizzes (or 4 weeks) after the start of TIP classes.

End

Appendix

Smartphones is the **most prevalent** digital device among teachers.



Teachers also have the **highest confidence** in smartphones.

