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## **Instrument to assess the knowledge and the skills of mathematics educators' regarding digital technology**

Given the growing importance and availability of digital technology (dT) in society, it is crucial for educators to develop knowledge and skills regarding dT and that such skills also can be measured reliably and objectively.

Thus, we have developed an instrument with multiple-choice (m-c) and open-text (o-t) items to methodically overcome some limitations of the frequently used Likert-scale self-assessment instruments yet being time efficient to rate. The items of the instrument are structured following the TPACK framework by Mishra and Koehler (2006) who extended the seminal framework of Shulman by adding technological knowledge (TK) to it; thus, creating the intersecting dimensions of technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPCK).

In our instrument we are using m-c items for TK and TCK and TPK targeting mathematic-specific dT like dynamic geometry software and general dT like interactive whiteboards and spread-sheet software. For TPCK, we elected to use o-t items, which are more time intensive to rate, but—in our minds—more accurately reflect the multifaceted nature of the dimension which combines TK, CK, and PK. Since in the o-t items we require participants to reason for or against the use of dT, we consider the items a skill—TPC-S—and not a knowledge assessment (Blömeke et al., 2015). In terms of content and coding, the TPC-S items are based on the findings of an interview study by Gonscherowski and Rott (2022). The results of pilot studies ( $n=34$ ) have shown that the TPC-S items can be rated objectively ( $\kappa > 0,8$ ) and that the items are valid since the responses align with the findings of (ibid.). The o-t items for TPC-S are a unique approach which balances the need for an objective and valid measurement and yet still being time effective to rate.

### **References**

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