

## MAPPING ECONOMICS TEACHERS' NEEDS IN DEVELOPING A HOTS-ORIENTED TPACK SELF-ASSESSMENT MODEL

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**Abstract.** This study aims to map the needs of economics teachers in Banyumas Regency who are members of the Economics Subject Teachers' Forum (MGMP Ekonomi) to develop a Technological Pedagogical Content Knowledge (TPACK) self-assessment model oriented toward High Order Thinking Skills (HOTS). The research employed a quantitative descriptive approach, with economics teachers at MGMP Ekonomi Banyumas as respondents. Data were collected using a needs questionnaire designed based on TPACK and HOTS indicators, and analysed descriptively through frequency distribution and percentages. The findings reveal that most economics teachers have recognised the importance of integrating technology into economics teaching, yet they still face challenges in implementing HOTS-based learning strategies effectively. Furthermore, teachers expressed the need for a self-assessment instrument that enables systematic reflection on their TPACK competence. These results highlight the urgency of developing an HOTS-based TPACK self-assessment instrument to support economics teachers' professional competence and enhance the quality of economics learning in senior high schools, particularly in Banyumas Regency.

**Keywords:** Economics Teachers; TPACK; HOTS; Self-Assessment Instrument.

### 1. Introduction

The rapid development of information and communication technology (ICT) has transformed the educational landscape, requiring teachers to deliver content and effectively integrate technology into the learning process. The Technological Pedagogical Content Knowledge (TPACK) framework is highly relevant, emphasizing that teachers must understand not only content (CK) and pedagogy (PK) but also how to select and apply appropriate technology (TK) to support meaningful learning. In the 21st-century educational era, there are additional demands that learning be not merely cognitive but also encourage higher-order thinking Skills (HOTS), namely, analysis, evaluation, and creativity, so that students are relevant to the complexity of real-world problems [1].

Several studies have attempted to link the concept of TPACK to higher-order thinking skills (HOTS). For example, the study "Analysis of HOTS-Based TPACK Ability" by Atmojo et al. found that university students and pre-service teachers demonstrated a relatively strong mastery of HOTS-based TPACK. However, weaknesses remained in the software evaluation [2].

In the field of economics education, developed a course-based model to strengthen TPACK competencies among prospective economics teachers through self-assessment,

demonstrating that this strategy can improve pedagogical, content, and technological aspects within specific domains [3]. Furthermore, research by Aulia *et al.* found that TPACK competency significantly influenced economics teachers' technology integration practices, and self-efficacy moderated this relationship [4].

However, there is a gap in the literature on mapping the needs of economics teachers for developing HOTS-based TPACK self-assessment instruments. Most studies remain limited to generic TPACK instruments, without considering the economics discipline's content or higher-order thinking dimensions. Furthermore, most research focuses on practical aspects or their correlations. However, it has not yet mapped the empirical needs of economics teachers in specific local contexts to develop truly context-appropriate instruments. For example, the study Pedagogical Content Knowledge in School Economics [5] noted that explicit studies on PCK in school economics remain very limited and rarely address the integration of technology (as part of TPACK) in school economics.

With this background, this study aims to contribute by mapping the needs of economics teachers in Banyumas for a TPACK self-assessment model enriched with HOTS indicators. This approach combines local empirical needs analysis (via questionnaires) with references to global TPACK-HOTS theories and instruments, resulting in an instrument that is not only adapted to the characteristics of economics teachers but also bridges relevant theory and practice. Thus, the results of this study are expected to provide an important foundation for the development of HOTS-based economic instruments and to guide the improvement of the professionalism of economics teachers in accordance with the demands of the 21st century.

## 2. Methods

The population of this study comprised all high school economics teachers in Banyumas Regency, totaling 69. The total sample comprised 18 teachers selected via convenience sampling. Data were collected using a questionnaire. The collected data were then analyzed using quantitative descriptive analysis.

## 3. Results And Discussion

### 3.1. Results

#### a. Identification of teacher requirements in HOTS-based TPACK self-assessment (technology, pedagogy, content aspects)

Economics teachers, as the spearhead of the economics learning process, can maximize learning outcomes by mastering the integration of technology into economics instruction. Competence in integrating technology, pedagogy, and content (TPACK) is essential for meeting the demands of 21st-century education. At the high school level, economics education aims to equip students with economic literacy, data-driven decision-making skills, and business acumen, all of which are strengthened by the appropriate use of technology.

Economics teachers are expected to be adaptive to technological developments and able to apply them in the teaching and learning process. Teachers' TPACK capabilities can be accurately mapped if valid and reliable evaluation instruments are available. Our team's research has identified the need to design HOTS-based TPACK evaluation instruments for economics teachers, based on interviews and questionnaire data. The description of the needs of vocational school economics teachers in HOTS-based TPACK evaluation is presented as follows. The compilation of a literature review document with the theme of HOTS-based TPACK self-assessment for teachers.

The results of the needs analysis are presented by examining the characteristics of economics teachers in Banyumas, as shown in the demographic table in Table 1.

**Table 1.** Respondent Demographics

| Gender | Amount | Percentage |
|--------|--------|------------|
| Female | 12     | 66,67      |
| Male   | 6      | 33,33      |

Of the 18 respondents who completed the questionnaire, the gender distribution was 12 female (66.7%) and 6 male (33.3%). The distribution of teaching experience shows  $\leq 3$  years for 2 respondents (11.1%); 4–7 years for 5 respondents (27.8%); 8–15 years for 1 respondent (5.6%);  $\geq 16$  years for 10 respondents (55.6%). This distribution is important for interpreting needs because novice teachers tend to emphasize technical support and practical examples, whereas experienced teachers place greater emphasis on curriculum alignment, authentic assessment strategies, and implementation feasibility. Table 2 presents a summary of the length of teaching experience of economics teachers in Banyumas:

**Table 2.** Data on the Length of Service of Economics Teachers in Banyumas

| Teaching Experience | Amount | Percentage (%) |
|---------------------|--------|----------------|
| $\leq 3$ years      | 2      | 11,11          |
| 4–7 years           | 5      | 27,78          |
| 8–15 years          | 1      | 5,56           |
| $\geq 16$ years     | 10     | 55,56          |

In addition to data on teaching experience, the research team also identified respondents based on their certification status. This data is presented in Table 3.

**Table 3.** Certification status

| Certification status | Amount | Percentage (%) |
|----------------------|--------|----------------|
| Already certified    | 14     | 0,77           |
| Not yet certified    | 4      | 0,22           |

Overall, this respondent profile provides a strong foundation for designing relevant and contextual HOTS-based TPACK self-assessment instruments. For novice teachers, items should emphasize media selection, learning scenarios, and structured, authentic assessment examples; for experienced teachers, the focus should be on curriculum and assessment alignment, case- or data-based task design, and practice reflection. Although the sample size remains limited, the emerging patterns are sufficiently consistent to guide the next stage, namely the drafting and testing of the model.

- b. The learning model currently used by economics teachers in high schools in the Banyumas region

Respondents' answers indicate that the most common practices are problem- and project-based active learning, group discussions, and case studies, interspersed with short lectures to reinforce concepts. Teachers also mentioned using presentation media, short videos, and simple, data-based exercises (graphs/economic news) to relate the material to current issues. Several responses mentioned the use of quiz platforms and LMS for assignments, but the extent of their use varies across schools and among educators.

c. Barriers to learning economics

Notable obstacles include limited face-to-face time for in-depth analytical activities, the availability and stability of devices/internet access, and the heterogeneity of students' digital literacy and learning motivation. Teachers also mentioned obstacles related to the availability of contextual teaching materials and ready-to-use HOTS assessment examples, which results in assessments that tend to stop at the basic understanding level. In some places, operational policy support and technical assistance for ICT are not evenly distributed, resulting in inconsistent technology integration.

d. Areas for improvement in economics education in the Banyumas region high schools

Respondents emphasized the need for practical strengthening of TPACK, including selecting digital tools appropriate for HOTS objectives (analysis, evaluation, creation), developing learning scenarios based on local data/issues, and developing a bank of questions and authentic assessment rubrics. Respondents also stated that structured training (workshops/mentoring) is needed to produce tangible artifacts, such as lesson plans/teaching plans that incorporate HOTS, contextual teaching materials, case-study assignment templates, and learning reflection guides. Collaboration among subject teacher working groups to share good practices and curate digital learning resources is also considered crucial.

e. Economic learning standards in the face of technological change

In general, standards are considered to provide direction for competencies; however, they must be translated into more operational terms for the context of digital transformation. Teachers seek more explicit guidance on ICT integration, including examples of data-based performance indicators, task models that foster higher-order thinking, the use of LMS/collaborative tools, and assessments that evaluate the reasoning process. Responses also highlight the importance of data literacy and digital ethics (e.g., source reliability, plagiarism/AI use policies) to ensure that learning standards remain adaptive to new technologies while maintaining academic integrity. Thus, updates to derivative standards (ATP, modules, and assessment tools) should emphasize the alignment between objectives and assessment activities within the digital ecosystem.

f. Teachers' need for technology in teaching economics in high school

Teachers' need for technology in high school economics education centers on the availability of tools and a work ecosystem that directly supports higher-order thinking skills (HOTS), including analysis, evaluation, creation, and data-based reasoning. The core tools needed include spreadsheets for data processing and visualization (S-D curves, elasticity, inflation/GDP trends), simple market simulations/modeling, LMS for task management, rubrics, feedback, diagnostic quizzes/polling, document collaboration, and access to open data sources (BPS/BI/World Bank). AI support is optional, as it is a form of light technical automation that does not replace reasoning. To be effective, teachers need ready-to-use content using lesson plan/ATP templates that link objectives, activities, HOTS assessments, local case study banks, and authentic rubrics, along with peer mentoring training (lesson study/peer review) and school policies/infrastructure that ensure stable device and internet access, with MGMP curation as a shared repository. Ideal implementation is carried out in stages, covering basic (spreadsheets, quizzes, LMS), intermediate (market simulations and collaboration), to advanced (interactive visualization and AI support) accompanied by digital ethics (data citation, anti-plagiarism, AI usage rules) and security/privacy.

### 3.2. Discussion

The results of the study indicate that economics teachers at Banyumas High School have different needs in developing HOTS-based TPACK self-assessment. Novice teachers require

more technical support, such as practical examples, media selection, and guidance on technology use, whereas experienced teachers focus more on curriculum alignment, authentic assessment, and reflection on learning practices. This condition underscores the importance of valid and reliable evaluation instruments to accurately assess teachers' TPACK abilities and incorporate HOTS indicators, enabling teachers to evaluate the extent to which learning fosters students' analytical, evaluative, and creative abilities [6], [7].

In teaching practice, economics teachers often use active models such as problem-based learning, project-based learning, discussions, and case studies combined with presentation media, videos, and data-based exercises. This shows a tendency to relate the material to real-world contexts and foster HOTS. However, significant obstacles remain, including limited face-to-face time for analytical activities, uneven access to the internet and devices, and a lack of HOTS-based contextual teaching materials. These obstacles are in line with the findings[8], which highlight the importance of infrastructure support and digital literacy for teachers as key prerequisites for the successful integration of technology in learning.

The necessary improvements include practical training that produces tangible artifacts such as HOTS-based lesson plans/ATP, authentic question banks and rubrics, as well as teacher collaboration through lesson study and peer review. Teachers also expect more operational, economic learning standards, with data-based indicators, the use of LMS, thinking-process assessment, and data literacy and digital ethics to be more relevant to the demands of the 21st century. This is consistent with research [9] that emphasizes the need for curricula and assessment standards that are adaptable to technological developments and oriented toward higher-order thinking skills. Thus, the development of HOTS-based TPACK self-assessment instruments is essential to support teacher professionalism and improve the quality of economics instruction in high schools.

#### **4. Conclusion**

Based on the study results, it can be concluded that economics teachers at Banyumas High School require a valid, reliable, and contextual HOTS-based TPACK self-assessment instrument. Novice teachers often require technical support and examples of technology-based learning practices, whereas experienced teachers emphasize curriculum alignment, authentic assessment, and reflective practice. The learning models used are primarily active learning approaches, such as problem- and project-based learning, discussions, and case studies supported by digital media, although they still face obstacles including time constraints, limited infrastructure, and a lack of contextual teaching materials. This underscores the importance of designing evaluation instruments that not only measure teachers' perceptions but also assess actual practices through HOTS indicators, thereby enhancing teacher professionalism and the quality of economics education in high schools.

The implications of this study are the need for practical teacher training that produces tangible artifacts in the form of HOTS-based lesson plans/ATP, question banks, authentic rubrics, and the use of LMS to support data-driven and collaborative learning. In addition, economic learning standards need to be translated into clearer operational guidelines, particularly regarding data literacy and digital ethics, to remain adaptive to 21st-century technological developments. Further research is recommended to test the validity and reliability of the self-assessment instruments designed, increase the sample size of teachers from various regions, and examine the effectiveness of the instruments in improving classroom learning practices. Thus, these instruments can serve as both diagnostic tools and instruments for the continuous professional development of economics teachers.

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