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Perceived Usefulness And Topic Attractiveness As Predictors Of TPACK-Based Teaching Readiness Among Indonesian EFL Teacher Professional Education Graduates

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Abstract

Teachers' readiness to integrate technology, pedagogy, and content is an important outcome of teacher professional education. This study examined the predictive contributions of the perceived usefulness and attractiveness of topics in Indonesia's Pre-Service Teacher Professional Education Program (Pendidikan Profesi Guru [PPG]) to TPACK-based teaching readiness. A quantitative correlational design with an ex post facto survey was employed. The respondents were 60 graduates of the 2024 Cohort 2 English Education PPG program who completed the program in 2025 at six teacher education institutions in western Indonesia. Data were collected using three four-point Likert-scale questionnaires, each comprising 20 items, and analyzed through multiple linear regression. The regression model was significant, $F(2, 57) = 18.549$, $p < 0.001$, with $R^2 = 0.394$ and Adjusted $R^2 = 0.373$. Perceived usefulness positively predicted TPACK-based teaching readiness ($B = 0.488$, $SE = 0.116$, $\beta = 0.443$, $t = 4.216$, $p < 0.001$). Perceived topic attractiveness was also a positive predictor ($B = 0.355$, $SE = 0.101$, $\beta = 0.370$, $t = 3.524$, $p = 0.001$). Perceived usefulness made a stronger relative contribution than topic attractiveness. These findings indicate that graduates' self-perceived TPACK readiness is associated with the extent to which PPG topics are considered relevant to professional tasks and capable of sustaining learning engagement. PPG providers should strengthen practical relevance, authentic experiences, active engagement, and repeated opportunities to integrate technology, pedagogy, and content.

Keywords: teacher professional education, perceived usefulness, perceived topic attractiveness, teaching readiness, TPACK

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INTRODUCTION

Digital transformation has expanded the competencies expected of teachers beyond mastery of subject matter and pedagogy to include the ability to select and use technology meaningfully. English teachers must do more than operate digital devices; they need to identify technologies that align with language-learning objectives, learner characteristics, instructional strategies, and assessment formats. The Technological Pedagogical Content Knowledge (TPACK) framework explains that effective technology use emerges from the integration of technological, pedagogical, and content knowledge rather than from mastery of each component in isolation (Mishra & Koehler, 2006). Pre-service teacher education should therefore provide experiences that enable participants to model, practice, evaluate, and reflect on technology-supported instructional decisions.

In Indonesia, the Pre-Service Teacher Professional Education Program (PPG) is a strategic pathway for preparing professional teachers through academic coursework, workshops, instructional-material development, field experiences, and reflection. Effective teacher education should connect theory with authentic classroom problems and provide opportunities to apply knowledge in professional contexts (Darling-Hammond et al., 2017; Yin, 2019). Evaluations of PPG indicate that program experiences can support participants' pedagogical and professional competence (Daud et al., 2020; Mardhatillah & Surjanti, 2023). Other studies have likewise shown that professional education can foster TPACK development when learning experiences systematically integrate content, pedagogy, and technology (Chang et al., 2024; Diamah et al., 2022).

Nevertheless, TPACK readiness does not develop automatically simply because participants have completed the program. Pre-service teachers may report different levels of confidence across TPACK domains and may still experience difficulty aligning technology with particular objectives, content, and contexts (Koşar, 2023; Valtonen et al., 2020, 2022). Research involving pre-service EFL teachers also suggests that self-assessed readiness should be interpreted cautiously because perceived readiness does not always correspond to observed teaching performance (Tutyandari, 2022). It is therefore important to identify features of the learning experience that are associated with graduates' readiness to integrate technology, pedagogy, and content after completing PPG.

One such factor is perceived usefulness. In the Technology Acceptance Model, perceived usefulness refers to the belief that a system or experience can improve performance (Davis, 1989). The meta-analysis by Scherer et al. (2019) confirmed that perceived usefulness is an important component of teachers' technology acceptance. In the PPG context, usefulness

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concerns not merely the ease of operating devices but also graduates' judgments that the topics studied help them plan instruction, select strategies and technologies, conduct assessments, and solve classroom problems. When participants perceive a direct connection between PPG topics and teachers' professional needs, they are more likely to internalize and apply that knowledge in practice.

A second factor is perceived topic attractiveness. Attractiveness encompasses attention, interest, personal and professional relevance, active engagement, and inspiration for self-development. Interest develops when learning experiences capture attention, sustain engagement, and create a personal connection with the material being studied (Hidi & Renninger, 2006; Rautiainen et al., 2018). Engagement also has behavioral, emotional, and cognitive dimensions that influence the depth of participation (Fredricks et al., 2004). Attractive PPG topics may therefore encourage exploration, persistence, reflection, and willingness to apply knowledge. Attractiveness, however, should not be equated with entertainment; an engaging learning experience must remain relevant and challenging while supporting participants' competence and autonomy (Deci & Ryan, 2000).

Numerous studies have examined pre-service teachers' TPACK, technology acceptance, and teaching readiness, yet little is known about how English Education PPG graduates' evaluations of program topics relate to their TPACK readiness. TPACK can be enhanced through structured integration experiences (Ali & Waer, 2023; Tondeur et al., 2019), whereas intentions and readiness to use technology are influenced by perceived usefulness, self-efficacy, and learning experiences (Luik & Taimalu, 2021; Pozas et al., 2022; Wah & Hashim, 2021). Öztürk et al. (2024) also demonstrated a relationship between TPACK and blended teaching readiness. However, few studies have specifically tested whether the perceived usefulness and attractiveness of PPG topics simultaneously predict TPACK-based teaching readiness among Indonesian EFL teacher education graduates.

This study aimed to examine: (1) the predictive contribution of the perceived usefulness of PPG topics to TPACK-based teaching readiness; (2) the predictive contribution of perceived topic attractiveness to TPACK-based teaching readiness; and (3) the combined contribution of both predictors and the relative strength of their contributions. Unlike a descriptive evaluation that only maps the level of each variable, this study used a regression model to explain variation in graduates' self-perceived TPACK readiness. Because the study employed a nonexperimental, cross-sectional design, the terms predict and predictive contribution refer to statistical relationships rather than causal effects.

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METHOD

This study employed a quantitative approach with an ex post facto correlational design. No treatment was administered and no variable was manipulated; data were collected after respondents had completed all components of the PPG program. The accessible population comprised 140 graduates of the 2024 Cohort 2 Pre-Service English Education PPG program who completed the program in 2025. They studied at Universitas Kuningan, Universitas Pendidikan Indonesia, Universitas Siliwangi, IKIP Siliwangi, Universitas Swadaya Gunung Jati, and Universitas Galuh. Sixty graduates who met the eligibility criteria and completed the instruments served as respondents. Thus, respondents were selected through nonprobability sampling based on eligibility and response availability rather than through random sampling from the entire population of PPG graduates.

The three variables were measured using closed-ended questionnaires with a four-point Likert scale: strongly agree, agree, disagree, and strongly disagree. Positively worded items were scored from 4 to 1, whereas negatively worded items were reverse-scored. Each variable was represented by 20 items, yielding a possible score range of 20-80. Perceived usefulness of PPG topics (X_1) covered the usefulness of the topics for understanding learners, planning and assessment, teaching practice, innovation and problem-solving, and professionalism. Perceived topic attractiveness (X_2) covered interest and attention, personal and professional relevance, interest in pedagogical innovation, active engagement, and inspiration for self-development. TPACK-based teaching readiness (Y) covered content-pedagogy integration, the selection of strategies and technologies, the design of technology-supported learning experiences, digital assessment and feedback, and TPACK reflection and adaptation. The instruments were developed from these indicators, reviewed by experts, and piloted before the main data collection.

Data were collected online after participants received information about the purpose of the study. Participation was voluntary, and responses were reported without identifying individual respondents. The data were checked for completeness, negatively worded items were reverse-coded, and total scores were calculated for each variable. Descriptive statistics were used to provide initial context through means and standard deviations. The principal analysis was multiple linear regression, with TPACK-based teaching readiness as the dependent variable and perceived usefulness and topic attractiveness as predictors.

Before the model was tested, residual normality was examined using the Kolmogorov-Smirnov test, multicollinearity was assessed through Tolerance and Variance Inflation Factor (VIF) values, and heteroscedasticity was examined using the Glejser test. The assumptions were

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considered satisfied when the significance value for normality exceeded 0.05, Tolerance exceeded 0.10, VIF was below 10, and the Glejser significance value for each predictor exceeded 0.05. Hypotheses were tested at a significance level of 0.05. Unstandardized coefficients (B) were used to construct the prediction equation, whereas standardized coefficients (β) were used to compare the relative contributions of the predictors. Model strength was reported using R^2 and Adjusted R^2. All analyses were conducted using SPSS 26.

RESULTS AND DISCUSSION

Results

Descriptive statistics showed that perceived usefulness had the highest mean (M = 64.82, SD = 6.86), followed by perceived topic attractiveness (M = 55.07, SD = 7.88) and TPACK-based teaching readiness (M = 48.78, SD = 7.57). Because the three instruments contained the same number of items and used the same score range, these mean scores provide initial context indicating that the usefulness of PPG topics was rated more strongly than their attractiveness and graduates' self-perceived TPACK readiness. The focus of this article, however, is not descriptive categorization but the ability of X_1 and X_2 to predict variation in Y.

Table 1. Descriptive Statistics of the Research Variables

Variable	N	M	SD	Minimum	Maximum
Perceived usefulness of PPG topics	60	64.82	6.86	49	80
Perceived attractiveness of PPG topics	60	55.07	7.88	40	73
TPACK-based teaching readiness	60	48.78	7.57	40	63

Regression Assumption Tests

The Kolmogorov-Smirnov test of the residuals produced an Asymp. Sig. value of 0.200, indicating that the normality assumption was satisfied. Both predictors had a Tolerance value of 0.965 and a VIF of 1.037, indicating no multicollinearity problem. The Glejser test yielded significance values of 0.297 for perceived usefulness and 0.071 for topic attractiveness. Both values exceeded 0.05, indicating no evidence of heteroscedasticity. Table 2 summarizes the assumption tests.

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Table 2. Summary of Regression Assumption Tests

Assumption	Indicator	Result	Decision
Residual normality	K-S Asymp. Sig.	0.200	Satisfied
Multicollinearity X_1	Tolerance; VIF	0.965; 1.037	Not detected
Multicollinearity X_2	Tolerance; VIF	0.965; 1.037	Not detected
Heteroscedasticity X_1	Glejser Sig.	0.297	Not detected
Heteroscedasticity X_2	Glejser Sig.	0.071	Not detected

Predictive Model of TPACK-Based Teaching Readiness

The multiple linear regression model was significant, $F(2, 57) = 18.549$, $p < 0.001$. The R value of 0.628 indicated a positive overall association between the predictor set and TPACK readiness. The model yielded $R^2 = 0.394$ and Adjusted $R^2 = 0.373$, with a standard error of the estimate of 5.274. Thus, the perceived usefulness and attractiveness of PPG topics jointly explained 39.4% of the variance in self-perceived TPACK-based teaching readiness. The remaining 60.6% was associated with factors not included in the model.

Table 3. Summary of Model Fit and Explained Variance

R	R^2	Adjusted R^2	SEE	F (df_1, df_2)	p
0.628	0.394	0.373	5.274	18.549 (2, 57)	< 0.001

The regression coefficients indicated that both predictors made positive and significant contributions. Perceived usefulness yielded B = 0.488, SE = 0.116, β = 0.443, t = 4.216, $p < 0.001$. With topic attractiveness statistically controlled, a one-point increase in the usefulness score was associated with a 0.488-point increase in the TPACK readiness score. Perceived topic attractiveness yielded B = 0.355, SE = 0.101, β = 0.370, t = 3.524, p = 0.001. With usefulness controlled, a one-point increase in the attractiveness score was associated with a 0.355-point increase in the TPACK readiness score.

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Table 4. Multiple Linear Regression Coefficients

Predictor	B	SE	β	t	p
Constant	-2.418	8.488	-	-0.285	0.777
Usefulness of PPG topics (X_1)	0.488	0.116	0.443	4.216	< 0.001
Attractiveness of PPG topics (X_2)	0.355	0.101	0.370	3.524	0.001

The resulting prediction equation was $\hat{Y} = -2.418 + 0.488X_1 + 0.355X_2$. The negative constant has no direct substantive interpretation because a score of zero lies outside the instruments' possible range; it is retained as a mathematical component of the model. Based on the standardized coefficients, perceived usefulness (β = 0.443) was a stronger relative predictor than topic attractiveness (β = 0.370), although both made significant unique contributions.

DISCUSSION

The first finding indicates that the perceived usefulness of PPG topics positively predicted TPACK-based teaching readiness. This result can be explained through the concept of perceived usefulness in the Technology Acceptance Model: individuals tend to accept and use knowledge or technology when they believe it will enhance their performance (Davis, 1989). In the PPG context, graduates who consider program topics relevant to instructional planning, strategy selection, assessment, problem-solving, and teaching practice are more likely to feel ready to integrate technology, pedagogy, and content. This finding extends the concept of usefulness beyond device acceptance to graduates' judgments of the overall value of their professional education experiences.

The contribution of perceived usefulness is also consistent with research positioning the relevance of teacher education experiences as a bridge between theory and practice. Darling-Hammond et al. (2017) and Yin (2019) emphasized that teacher education becomes effective when conceptual knowledge is connected to authentic classroom decisions. Within PPG, topics such as understanding learners, principles of teaching and assessment, instructional-material development, and field experience provide contexts in which participants can recognize the concrete functions of professional knowledge. Chang et al. (2024) and Diamah et al. (2022) also showed that integratively designed teacher education experiences can strengthen TPACK. A sense of readiness therefore arises not only from knowing the components of TPACK but also

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from understanding how their integration supports teaching tasks.

The second finding shows that topic attractiveness made a unique contribution even after usefulness was controlled. Engaging learning experiences can enhance attention, cognitive engagement, and willingness to explore instructional alternatives. In the model of interest development, repeated engagement can transform situational interest into a more stable form of interest (Hidi & Renninger, 2006). Rautiainen et al. (2018) demonstrated that interest during teacher education develops through personal relevance and meaningful professional experiences. PPG topics presented through authentic problems, collaboration, microteaching, media design, and reflection may therefore encourage graduates to experiment more actively with TPACK integration.

Topic attractiveness in this study cannot be separated from the quality of instructional design. Emotional engagement without cognitive challenge may produce only short-term enjoyment, whereas professional readiness requires practice, feedback, and reflection. Fredricks et al. (2004) distinguished among behavioral, emotional, and cognitive engagement, while Deci and Ryan (2000) emphasized the importance of autonomy, competence, and relatedness. PPG providers should therefore make topics engaging through meaningful participation, responsible choice, appropriate challenge, and opportunities to produce professional products or performances rather than by merely simplifying the content.

Perceived usefulness made a stronger relative contribution than topic attractiveness. This pattern suggests that, for professional education graduates, judgments of direct benefits for teachers' work are more closely associated with TPACK readiness than affective interest alone. The result is consistent with technology-acceptance research that positions perceived usefulness as an important explanation of intention to use technology (Scherer et al., 2019; Wah & Hashim, 2021). Luik and Taimalu (2021) likewise showed that pre-service teachers' intentions to use technology can be predicted by beliefs and judgments concerning technology use. Nevertheless, the beta coefficient for topic attractiveness remained significant; therefore, programs should not treat relevance and attractiveness as competing priorities. Both should be present: topics must be professionally useful and experienced through learning processes that sustain engagement.

The R^2 value of 0.394 indicates that the two perceptions explained a meaningful proportion, but not all, of the variance in TPACK readiness. Teaching readiness is a complex construct that may also be influenced by self-efficacy, teaching experience, the quality of field practice, access to technology, mentor support, school climate, and opportunities for reflection. Öztürk et al. (2024) found a relationship between TPACK and blended teaching readiness, while

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Ke et al. (2026) highlighted the association between TPACK and the self-efficacy of pre-service EFL teachers. Valtonen et al. (2020, 2022) further demonstrated that TPACK components may develop unevenly. Consequently, the 60.6% of unexplained variance represents an important direction for further research rather than evidence that the model lacks value.

A practical implication of this study is the need to align each PPG topic with clearly defined professional performance. A topic may begin with an authentic problem in English language teaching and conclude with a product or demonstration, such as a teaching module, communicative task, digital medium, assessment instrument, microteaching performance, or reflection on pedagogical decisions. Instructor modeling, collaboration with mentor teachers, practice across diverse contexts, and iterative feedback are important strategies for TPACK development (Ali & Waer, 2023; Anggrarini & Yulianawati, 2025; Tondeur et al., 2019). Program evaluation should assess not only participant satisfaction but also the extent to which each topic is perceived to support professional tasks, sustain engagement, and transfer to instructional design and implementation.

This study has several limitations. First, the respondents were 60 available graduates from six teacher education institutions in western Indonesia; therefore, probabilistic generalization to all PPG graduates is not possible. Second, all variables were measured through self-reports collected at one point in time, so potential common-method bias and differences between perceived readiness and actual performance should be considered. Third, the cross-sectional design does not permit causal conclusions. Future research should combine questionnaires with lesson-design rubrics, teaching observations, interviews, and longitudinal data and should test other predictors, such as self-efficacy, mentoring quality, practical experience, and support within the school environment.

CONCLUSION

The perceived usefulness and attractiveness of PPG topics simultaneously predicted English Education PPG graduates' self-perceived TPACK-based teaching readiness, explaining 39.4% of its variance. Individually, usefulness and attractiveness each made a positive and significant contribution, although usefulness had the stronger relative contribution. Accordingly, the three research objectives were addressed: the professional usefulness of PPG topics, the attractiveness of the learning experience, and their combined contribution were associated with graduates' readiness to integrate technology, pedagogy, and content. These findings do not establish a causal relationship; instead, they emphasize the importance of designing PPG experiences that are relevant, engaging, contextualized, and practice-oriented. PPG providers

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are advised to connect each topic with authentic tasks performed by English teachers and to provide repeated opportunities for modeling, practice, reflection, and feedback so that TPACK knowledge can develop into stronger readiness for action.

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