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Exploring the Impact of Professional Value and Perceived Adoption Control on Continuous Professional Development Engagement via Digital Teaching Platform : A Structural Equation Modelling Approach

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Abstract: This study aims to examine the impact of professional value and perceived adoption control on teachers' CPD engagement via a digital teaching platform. This study used a quantitative approach with a survey method. It involves 313 high school teachers in Pati, Grobogan and Semarang Central Java with at least a year of experience in using the digital teaching platform. The instrument used in this study is a 5-point Likert scale item survey with 21 questions covering 11 constructs adapted from TAM. It uses Jamovi to analyze and model the data statistically. Structural Equation Modelling examines the relationship between variables proposed in the model. The result of the study shows that perceived professional value moderately impacts teachers' CPD Engagement. The constructs strongly mediate their CPD engagement through the perceived adoption control construct. The SEM analysis indicates that the proposed model is a good fit, as the fit indices show. The conceptual implication of the findings demonstrates that it extends TAM 2 in CPD context using a digital teaching platform. Practically, CPD program should align the technology tools with teachers' professional goals and ensure it is part of the professional culture rather than leaving it as optional or voluntary practices.

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Introduction

Teaching in this 21st century could not be separated from adapting and continuously being involved in self-development to keep up with the advancement of pedagogical research and the vast emergence of technologies. Teachers are faced with a diversity of students' needs and characteristics. They should be able to address students' needs accordingly. Therefore, Continuous Professional Development (CPD) is crucial for teachers. It becomes a primary need for them to plan, deliver, and evaluate their teaching effectively. Their competencies are at stake, from their pedagogical and social to professional ones. Teachers should possess all three competencies well to remain effective in the dynamic teaching environment and to be able to develop their students' 21st-century skills. Darling-Hammond et al. (2017) define professional development as structured professional learning that enables teachers to lead transformation both in their teaching practices and their students' learning outcomes.

Continuous Professional Development could be done through various activities such as workshops, seminars, formal or informal courses, mentoring, peer learning, and independent learning (Bleach, 2015; Fütterer et al., 2023; Hammond et al., 2017; Tan et al., 2025). They could also develop their competencies in teaching through their action research,

which could improve the quality of their teaching. It is an ongoing journey that cannot stop just because they have completed their teaching degrees. Through CPD, teachers can develop a growth mindset through reflective practice. They also could deepen their knowledge as well as their pedagogical skills. Certainly, CPD impacts positively on teachers as it provides opportunities for them to be progressive in their teaching and learning practices.

One area of knowledge that teachers could develop through CPD activities is their technological skills. In this big data era, teachers could not separate themselves from the advancement of technology. Many emerging technologies could help and support their teaching and learning activities, from developing their competence and assisting teachers in completing their administrative work to performing and reporting students' assessments. In the area of CPD, there are various technologies available that teachers could explore, from the simplest ones to Artificial Intelligence-based tools (Parsons et al., 2019; Siminto et al., 2023; Tan et al., 2025). UNESCO ICT Competency Framework for Teachers (CFT) states that teachers need to possess ICT (Information Communication and Technology) they can integrate skills into their classroom activities (UNESCO, 2018). One of the aspects emphasized in this ICT CFT is the use of technology for teacher professional learning. It demonstrates that teachers must use technological resources to support their Continuous Professional Development. This framework supports Schuman's idea of TPACK (Technology Pedagogy and Content Knowledge) that enables teachers to integrate technological tools into their teaching effectively (Graham et al., 2012; Schmidt et al., 2009)

In the Indonesian context, especially in responding to the needs in the pandemic and post-pandemic era, the government has launched a digital teaching platform as resources that teachers could easily access named Platform Merdeka Mengajar (Kementerian Pendidikan, Kebudayaan, 2022; Kementerian Pendidikan, Kebudayaan, Riset, 2020) which is now being transformed into Ruang GTK (Teacher and Education Profession Room). This platform provides teachers with access to self-development programs so that they do not have to rely on regional educational institutions to provide them with workshops.

The platform also enables teachers to share their best practices in teaching so that they can learn from each other. Besides, teachers could utilize the platform to perform assessments for the students. One significant feature of the platform is that it provides courses that the teachers can take, and they get a completion certificate acknowledged by the government to advance their careers. Teachers could independently choose any topic related to their interests and needs with these courses. This feature helps teachers develop their professional skills (Kemendikbudristek, 2023). How teachers utilize this digital platform in their continuing professional development will certainly open up the opportunity to further investigate any phenomena related to this specific use of technology. Using the Technology Acceptance Model as a lens will provide the opportunity to examine the factors impacting their technology use towards their CPD engagement. This study examines how teachers perceived professional value and ease of use influence their CPD engagement via a digital teaching platform.

Previous studies on PMM have heavily focused on the investigation of each feature offered by the platform (Eliya Husnatu, Ramdini, Neng Siti Nur, Sadiyah, Zahira, 2022; Hijriani et al., 2024; Ma'ruf & Yasin, 2024; Mujahidin, 2023; Triningsih et al., 2024) and any workshop on how to use the platform (Anggraeni & Rizaldi, 2023; Hasmawaty et al., 2023; Muhafid et al., 2023; Rohimat et al., 2022; Srianita et al., 2023; Surani et al., 2022). Therefore, investigating how teachers engage themselves in CPD through this digital platform will shed light on the drivers of teachers' technology adoption and what key

indicators most affect teachers in their technology practices, especially in supporting their CPD.

One of the most well-known frameworks for adopting new technology is the Technology Acceptance Model known as TAM (Venkatesh & Davis, 2000). This framework has also been applied in educational contexts as there are many emerging technologies in learning. Investigating technology practice from the TAM perspective has been carried out in various educational contexts concerning both teachers and students (Abdalla, 2024; Alyoussef, 2022; Kastorff et al., 2023; Teo, 2011a, 2015; Y. Yao et al., 2022; Zhuang et al., 2020). In the context of Continuous Professional Development, the Technology Acceptance Model will provide a robust framework to analyze and identify factors that influence teachers' use of technology in their professional development path. Two key factors influencing technology adoption, as suggested in the original TAM framework, are perceived usefulness and perceived ease of use of the technology (Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). The first construct, perceived usefulness, refers to users 'belief that technology will enhance their job performance. This factor proves to be one of the determinants in teachers' decision whether to use technology in their practices (Antonietti et al., 2022)

Meanwhile, perceived ease of use means how easily the users believe that they can use it (Rafique et al., 2024; N. Yao & Wang, 2024). When teachers find that using technology is not challenging, it improves their self-efficacy. Otherwise, if the teachers feel that using technology is difficult, it may hinder them from integrating it into their practices. It is essential that the teachers perceive that the technology they are using is easy to navigate and user-friendly, and they can operate it with minimal training (Teo, 2011a)). Some studies suggest that perceived ease of use significantly influences whether teachers decide to adopt the technology (García-Vandewalle García et al., 2023; Velli & Zafiropoulos, 2024). It not only predicts teachers' intention to use technology but also positively impacts teachers' technology integration. Some factors affect how teachers perceive the ease of technology adoption. Technical proficiency or computer self-efficacy is likely to contribute to this aspect. When the teachers see themselves able to operate the tools with less help, it usually correlates positively with their intention to use the technology (Albion & Ertmer, 2001). When teachers see an alignment between technology and pedagogical goals, they embrace the potential of using technology to facilitate their teaching practices (Schmidt et al., 2009).

This study brings a new focus on professional value and perceived adoption control on teachers' CPD engagement. Many studies focus on technology use as the endpoint, while this study proposes a model that connects technology adoption to active CPD engagement. The empirical data will provide the opportunity to validate and examine the relationship between the factors influencing teachers' decision to use the teaching digital platform for their CPD engagement.

This study proposes or extends an additional construct to the Technology Acceptance Model corresponding to teachers' Continuous Professional Development context. The construct is called CPD engagement, which refers to how teachers engage with technology for their professional learning from planning their lessons, classroom practices, assessment, and reflection practices. These activities take place in a cycle during their teaching and learning practices. Teachers engage in their self-professional learning, including continuous learning, by accessing any possible supporting resources to enhance their pedagogical skills. This could be done independently or collaboratively through peer learning (Otamirzayeva, 2024).

Good professional development activities encourage teachers to be active learners in designing and executing their teaching strategies in the classroom (Hammond et al., 2017). At

the same time, continuing professional development should support collaborative learning that provides spaces for the teachers to safely share, practice, and reflect in the mediated environment.

Research Method

This study utilized a quantitative approach with a survey method to see the relationship between variables or constructs being investigated. The quantitative approach allows the study to examine the central tendency represented by the data (Creswell, 2012; Hancock & Mueller, 2010; Marzano et al., 201.5). In addition, this approach enables generalization from the data sample of the population being studied (Creswell, 2012). Besides generalizability, the quantitative survey approach provides objective measurement through the standardized instrument. The approach will also allow us to identify the trends and patterns derived from the data. Once the data is analyzed, it could provide insight into the prevalence of how teachers engage themselves with the technology to support their continuous professional development.

This study used a purposive sampling method to get the population sample. The purpose was to investigate teachers who have used the digital teaching platform (PMM) in their teaching journey for at least a year and installed the PMM application on their devices. There were 313 teachers from schools in Pati, Grobogan and Semarang, Central Java. These teachers consented to their right to participate in this study through the form distributed along with the survey instrument. The instrument used in this study was a 5-point Likert scale item. There were 21 items used in the survey encompassing 11 constructs adapted from TAM: behavioural intention, continuous professional development, perceived usefulness, perceived ease of use, social norm, voluntariness, experience, image, job relevance, output quality, and result in demonstrability. This study tried to extend the TAM with three latent variables. They were perceived professional value, Perceived Adoption Control, and CPD engagement. The data were collected using an online form (Google form) distributed to the teachers in three regions; Pati, Grobogan and Semarang Central Java. Once the data was collected, it was analyzed statistically using Jamovi.

The data went through each process, from generating the descriptive statistics, performing reliability and validity of the items, and doing independent T-tests for the data. Having done all those tests, a confirmatory factor analysis was done. Once the result confirmed the observed factor or variable, structural equation modelling was run to see if the model was. The Jamovi Software package ran all the data analysis processes. The hypothesis being investigated in this study were

1) Teachers' Perceived Professional Value influences their CPD Engagement, and their perceived adoption control (PAC) mediates the relationship between PPV and CPD Engagement.
2) Teachers' Perceived Adoption Control influences their CPD Engagement
3) Teachers' Perceived Professional Value influences their Perceived Adoption Control (PAC)

Those hypotheses were tested for their correlation through Structural Equation Modelling (SEM), which was well-suited to testing the relationship between variables and the latent variables.

Results and Discussion

This study involved 313 high school teachers in Central Java. 59% of the participants were male, and the rest were female. The participants' ages ranged from 20 to over 5d. The

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biggest percentage of the participants was in the 31- 40 age group, consisting of 183 teachers, and the smallest percentage was in the over-50 age group, consisting of only 22 teachers. Look at Figure 3 for complete information on the percentage of each age group participating in this study.

The descriptive statistics (see Table 1) showed that the central tendency (Creswell, 2012), as indicated by the mean value, ranged between 3.77 (OQ; output quality construct) and 4.03 (PU; perceived usefulness construct). It reflected that the participants provided high rating scores across the variable. Regarding variability, as suggested by the standard deviation, the lowest score was 0.622 on the Result Demonstrability (RD) construct, which shows that the construct had the most consistent responses. The skewness values between –1 and 1 and kurtosis values of –1 and +2 indicated that the distribution is close to normal. The complete information on the means score of each construct, standard deviation, skewness and kurtoses were presented in the following table (Table 1).

Table 1. Descriptive Statistic

	BI	CPD	PU	PEU	SN	OQ	RD	VOL	EXP	IMG	JR
Mean	3.97	3.98	4.03	3.94	3.94	3.77	3.85	3.94	3.87	3.81	3.92
Median	4	4	4	4	4	4	4	4	4	4	4
Skewness	-0.73	-0.54	-0.68	-0.41	-0.44	-0.29	0.053	-0.79	-0.45	-0.46	-0.78
Kurtosis	0.914	1.33	1.51	0.604	0.823	0.673	0.061	0.687	0.415	0.567	1.18

To determine the reliability and validity of the constructs investigated in this study, a reliability test was performed to see the internal consistency and Pearson's Product Moment correlation for validity (Lutabingwa & Auriacombe, 2019). The coefficient of Cronbach's alpha was 0.961, suggesting that the items were reliable for measuring the constructs (See Table 2).

Table 2. Scale Reliability Statistic

	Mean	Cronbach's α	McDonald's ω
scale	3.92	0.961	0.962

All the items used in the survey indicated high internal consistency. The Pearson's r of all the items was higher than the critical value for Pearson's r, which was 0.113 (Table 3). This demonstrated that all the items were valid when measuring what was supposed to be measured.

The Independent Sample T Test and Man-Whitney U Test compare the two independent groups, male and female, on the variables in this study. Five variables in this study had significant results, $p<0.05$. It suggested that different groups perceived the variables differently. The strongest significance was for the Output Quality variable, with a p-value of 0.008. It indicated that male and female teachers perceived output quality differently. Meanwhile, CPD, SN, RD, JR, ATT, IMG, and VOL showed no difference across the group. Their p-value was >0.005.

Confirmatory Factor Analysis was performed to confirm the factor structure of the proposed model in this study and to assess the measurement validity of the constructs(SÜRÜCÜ & MASLAKÇI, 2020). The results of the Confirmatory Factor Analysis are presented in the following Figure (Figure 1).

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Factor	Indicator	Estimate	SE	Z	p
CPDEngagement	BI1	0.77	0.0424	18.2	< .001
	BI2	0.687	0.0379	18.1	< .001
	CPD1	0.626	0.037	16.9	< .001
	CPD2	0.62	0.0346	17.9	< .001
	PU1	0.613	0.0377	16.3	< .001
	PU2	0.67	0.0364	18.4	< .001
PerceivedAdoptionControl	PEU1	0.614	0.0383	16	< .001
	PEU2	0.64	0.0371	17.2	< .001
	PEU3	0.664	0.038	17.4	< .001
	PEU4	0.62	0.0358	17.3	< .001
	SN1	0.585	0.0406	14.4	< .001
	SN2	0.521	0.0391	13.3	< .001
	VOL	0.62	0.0464	13.4	< .001
PPV	IMG	0.494	0.0393	12.6	< .001
	EXP	0.612	0.0395	15.5	< .001
	OQ1	0.533	0.0377	14.1	< .001
	OQ2	0.495	0.0378	13.1	< .001
	RD1	0.512	0.0417	12.3	< .001
	RD2	0.505	0.0323	15.6	< .001
	RD3	0.61	0.0359	17	< .001
	JR	0.617	0.0397	15.5	< .001

Figure 1. CFA Factor Loadings

The figure showed that the factor loading for each construct was statistically significant, as indicated by the p-value <0.001. It suggested that all constructs contributed to the respected latent variables. The latent variables in this CFA were CPD Engagement, PPV (Perceived Professional Value), and Perceived Adoption Control (PAC)

Figure 2 confirms the proposed model's factor structure. It shows that six indicators from the three constructs measure latent variables (factors): CPD engagement, behavioural intention (BI), continuous professional development (CPD), and Perceived usefulness (PU). This aligns with a study showing that Perceived usefulness significantly contributes to teachers' technology practice (Aurangzeb et al., 2024; Teo, 2011b). In this study, it was the use of the digital teaching platform for their CPD activities.

Meanwhile, the Perceived Adoption Control latent variable (factor) is measured by seven indicators from 3 corresponding constructs. They were perceived ease of use (PEU), Social Norm (SN) and Voluntariness (VOL) constructs. The last latent variable was PPV (Perceived Professional Value), which consisted of 9 indicators representing six constructs: Image (IMG), attitude (Att), Experience (Exp), Output Quality (OQ), Result Demonstrability (RD) and Job Relevance (JR), how teachers perceive their image from their peers and the relevance of their job are indeed the contributing factors to how teachers use technology (Kong et al., 2024). The arrow between CPD Engagement and Perceived Adoption Control suggests that these two latent variables mutually influence. The following figure (Figure 2) shows how each latent variable was measured by the indicators or the items presented on the survey.

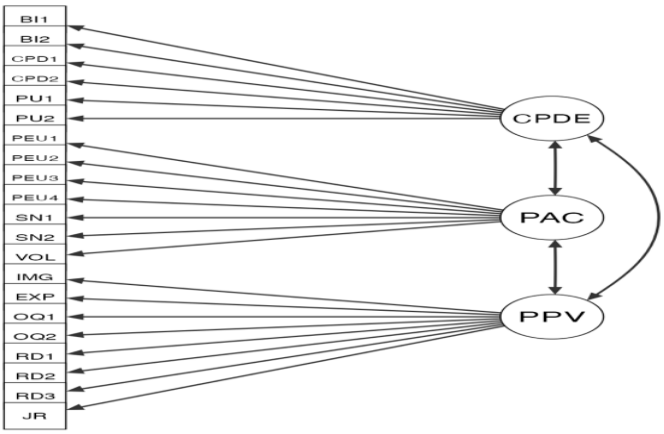

Figure 2. Confirmatory Factor Analysis Path

As proposed earlier, three factors were observed and measured, and the fit indices indicated that the model was a good fit with an SRMR (Standardized Root Mean Square Residual) of 0.042 (see Table 2). The threshold for good fit SRMR was <0.008. It suggested that the model had small residual errors. Based on the RMSEA, the model was also acceptable, as it was still in the range of 0.06 -0.08. Structural Equal Modelling

Table 3. Fit Indices

		95% Confidence Intervals		
SRMR	**RMSEA**	**Lower**	**Upper**	**RMSEA p**
0.042	0.077	0.07	0.084	< .001

The proposed model was proven to be good or acceptable, as indicated by the key fit indices shown in the following table (see Table 3). All indices above 0.9 suggested that the model had an acceptable fit.

Table 4. Key Fit Indices

	Model
Comparative Fit Index (CFI)	0.924
Tucker-Lewis Index (TLI)	0.915
Bentler-Bonett Non-normed Fit Index (NNFI)	0.915
Relative Noncentrality Index (RNI)	0.924
Bollen's Incremental Fit Index (IFI)	0.924

Hypothesis 1 Teachers' Perceived Professional Value influences their CPD Engagement, and their perceived adoption Control (PAC) mediates the relationship between PPV and CPD Engagement

The model showed that PPV (Perceived Professional Value) was positively correlated with CPD Engagement with a coefficient of 0.18. It reflected a moderate relationship between those two constructs. It suggested that higher professional value leads to higher CPD engagement. This showed how teachers perceived their CPD activities as beneficial for their professional growth. They considered whether their CPD enhanced their professional reputation and whether it was relevant to their job. It turned out that PPV did not directly influence their CPD engagement; however, it indirectly influenced CPD Engagement through the PAC constructs. In short, the first hypothesis was accepted through its indirect influence on the construct. Teachers' perceived professional value moderately influenced their CPD engagement; it was strongly channeled through the perceived adoption construct instead. Teachers' perceived professional value which was influenced by experience, image, output quality, result demonstrability and job relevance impacted their CPD engagement via what externally and internally (N. Yao & Wang, 2024) influences their technology adoption; the perceived adoption control.

Hypothesis 2 Teachers' Perceived Adoption Control (PAC) influences their CPD Engagement

The path coefficient between Perceived Adoption Control (PAC) and CPD Engagement was 0.91 (see Figure 3). It suggested that PAC significantly affected teachers' CPD engagement. The higher the PAC, the more likely the teachers were to engage in their CPD activities. It suggested how their peers view their image influenced their engagement in professional development practices. As indicated by the $\beta = 0.755$, the effect was significant (See Table 4). Therefore, the hypothesis was accepted that teachers' perceived adoption control which was measured by how teachers perceived the ease of use of technology and

their peer pressure impacted their technology adoption positively influenced their CPD engagement (Aurangzeb et al., 2024; Rafique et al., 2024).

Table 5. Estimate Parameter

Dep	Pred	Estimate	SE	95% Confidence Intervals Lower	Upper	β	z	p
CPD Engagement	Perc Adoption Control	0.906	0.21	0.494	1.317	0.755	4.31	< .001
CPD Engagement	PPV	0.184	0.196	-0.2	0.568	0.158	0.94	0.347
PercAdoptionControl	PPV	0.900	0.06	0.776	1.025	0.922	14.19	< .001

Hypothesis 3 Teachers' Perceived Professional Value influences their Perceived Adoption Control (PAC)

The path coefficient between PAC and PPV was 0.90. It showed a strong relationship between the two constructs. It suggested that the higher the teachers' perceived professional value, the stronger their Perceived Adoption Control. These two constructs correlated positively. It showed that when the teachers had high PPV, they would likely have stronger PAC around their CPD activities. Therefore, this hypothesis was proven. Teachers' PPV did influence their PAC in their CPD engagement.

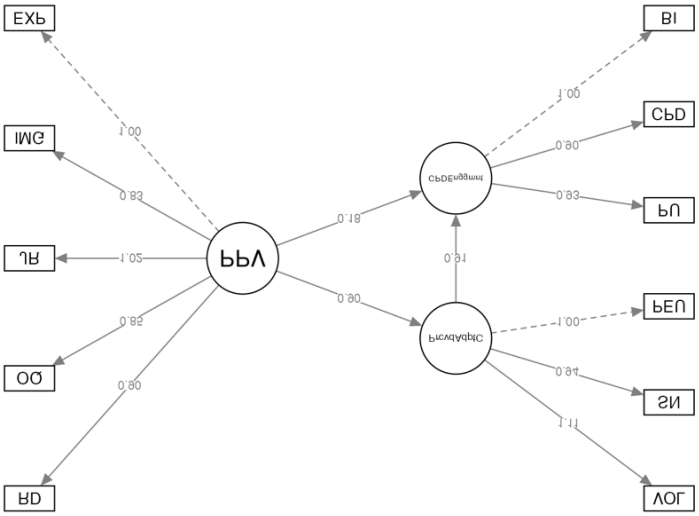

Figure 3. Teachers' CPD Engagement in Using Digital Teaching Platform Model

The teacher's CPD Engagement in Using the Digital Teaching Platform Model has defined the path or the relationship between the constructs involved in looking at technology practice in their CPD. The model clearly showed three constructs contributing to teachers' use of digital technology platforms to support their continuous professional development. How teacher perceived their professional value, perceived ease of use and social norms significantly contributed to their CPD engagement. The three latent variables encompassing all the constructs in TAM 2 (Venkatesh & Davis, 2000) indeed impacted teachers' engagement in their continuous professional development activities.

The conceptual implications of the findings of this study are that it extends TAM 2 specifically in the teachers' CPD context in using the teaching digital platform. It

demonstrates that professional value perception and social norms drive teachers' CPD engagement. Practically, the CPD program should align the technology tools with teachers' professional goals. It also needs to ensure the use of a digital teaching platform to be part of its professional culture, rather than leaving it as a voluntary practice.

Conclusion

The result of the study suggested that teachers perceived adoption control encompassing how they perceived the ease of use of the digital teaching platform, the external influence on control, like the social pressure, and the perception of their freedom in using the platform significantly influences their decision to use the platform for their continuing professional development. Their perceived professional value moderately influences their CPD engagement, but at the same time, it mediates strongly through the Perceived Adoption Control (PAC). Their perceived professional value significantly influences their perceived adoption control on how they engage in their CPD activities. This study is still limited to using the digital teaching platform in the last two years; a further study covering the newly transformed platform will likely give insights into sustainable technology practices. The proposed model could be further refined to capture teachers' CPD engagement via this digital teaching platform.

Recommendation

This study recommends that policymakers should make digital teaching platforms visibly useful for teachers' real tasks, and ensure that the platform is easy to use and socially endorsed through organizational and leadership support and community or peer-sharing practices. Meanwhile, teachers should recognize and strengthen their professional value alignment through their reflective practice in using technology for their CPD engagement. Recommendations for further studies could explore the proposed model in a similar context with wider subjects such as primary school and junior high school teachers. It is also advantageous to see how the newly transformed platform could address teachers' needs in their continuing professional development. The proposed model could be further refined to capture teachers' CPD engagement via this digital teaching platform.

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