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Learning Management System in Madrasah: A Study of Teacher Readiness and Acceptance of Technology

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Abstract:

This study aims to analyze the application of learning management systems in the form of technology to support the implementation of learning. Specifically, this study aims to ascertain the relationship between the teacher's technology acceptance model and the technology readiness index. At the elementary school (SD/MI), junior high school (MTs), senior high school (MA), and vocational schools in the city of Bandung, 185 private teachers participated in the survey. The results showed that perceived ease of technology was positively and significantly influenced by optimism and innovation, positively and significantly influenced by insecurity, and negatively or not significantly affected by discomfort. Then, optimism significantly increases people's perception of how helpful technology can be. While innovativeness and inconvenience have little effect on how useful technology is for people, perceived ease of use and insecurity have a small but positive effect. The implications of this research can be explained by the fact that teachers' acceptance of technology in learning can determine their optimism and innovation in learning. Therefore, teachers must be encouraged to prepare various skills and competencies to use technology to support their teaching and learning activities.

Keywords: *Learning Management System, Optimism, Innovation*

Abstrak:

Penelitian ini bertujuan untuk menganalisis penerapan learning management system berupa pemanfaatan teknologi untuk mendukung pelaksanaan pembelajaran. Secara spesifik, penelitian ini bertujuan untuk memastikan hubungan antara model penerimaan teknologi guru dan indeks kesiapan teknologi. Di tingkat sekolah dasar (SD/MI), sekolah menengah pertama (MTs), sekolah menengah atas (MA), dan sekolah kejuruan di Kota Bandung, 185 guru swasta berpartisipasi dalam survei tersebut. Metoda penelitian yang digunakan adalah kuantitatif. Hasil penelitian menunjukkan bahwa persepsi kemudahan teknologi dipengaruhi secara positif dan signifikan oleh optimisme dan inovasi, secara positif dan signifikan dipengaruhi oleh ketidakamanan, dan secara negatif atau tidak signifikan dipengaruhi oleh ketidaknyamanan. Kemudian, optimisme secara signifikan meningkatkan persepsi orang tentang betapa bermanfaatnya teknologi. Sementara keinovatifan dan ketidaknyamanan memiliki pengaruh yang kecil terhadap seberapa bermanfaatnya teknologi bagi orang-orang, persepsi kemudahan penggunaan dan rasa tidak aman memiliki pengaruh yang kecil namun positif. Implikasi penelitian ini dapat dijelaskan dengan fakta bahwa penerimaan guru terhadap teknologi dalam pembelajaran dapat menentukan optimisme dan inovasi mereka dalam pembelajaran. Oleh karena itu, guru perlu didorong agar mempersiapkan berbagai keterampilan dan kompetensi untuk menggunakan teknologi guna mendukung kegiatan belajar mengajar mereka.

Kata Kunci: *Learning Management System, Optimisme, Inovasi*

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INTRODUCTION

Rapid information and communication technology (ICT) changes are now essential in changing education management. To improve the quality of world education, UNESCO, which operates in the fields of education, knowledge, and culture, seeks to plan four pillars of education: (1) learning to know, (2) learning to do, (3) learning to be, and (4) learning to live together. In this case, learning technology is one of the changes in education management. Learning technology, whose current application is utilizing ICT processes and products to solve educational and learning problems, has many benefits and advantages (Rorim Panday, 2020).

As the teacher, the readiness of teachers to use digital tools and technologies methods of network integration in their professional activities (Kamahina, Yakovenko, & Daibova, 2019). Technological developments in learning and other fields encourage educational institutions to implement an effective and efficient learning management system (LMS). The effective use of LMS can create interactive, student-centered learning and meet the needs of diverse students (Veluvali & Surisetti, 2022), so the use of the system (LMS) has a significant relationship with the effectiveness of learning (Chaw & Tang, 2018). Therefore, leaders or managers of educational institutions are obliged to support the effectiveness of learning by providing learning technology facilities.

Facilitating the use of e-learning by the school is one approach to advancing educational technology (Sulisworo & Hidayati, 2021). Online learning is very much needed (Hidayati & Saputra, 2020). However, in the e-learning system, which is now widespread in public, learners (students) are naccessibleree in terms of access, and they face a computer somewhere to study (Hari, Darmanto, & Hermawan, 2013). Although anyone can utilize technology, how it is used relies on the degree of readiness of a person to accept the technology.

During COVID-19, the online learning system using technology in Indonesia was not without problems. The problems faced regarding online learning include: The results of the study show that the problematic aspects of implementing online learning policies include: (a) pedagogical competence and mastery of educator technology; (b) readiness and ability of students; (c) education stakeholder support; and (d) supporting facilities and infrastructure (Rifa'i, 2023). Challenges related to teacher readiness and acceptance of the use of technology in learning based on research from (Andarwulan, Al Fajri, & Damayanti, 2021) show that teachers: 50% do not understand the content of learning, 24% have inadequate technological tools, 67.6% less adaptable in applying technology; 20.4% are less able to buy internet data packages; and 40.4% had difficulty finding an internet signal. This study concluded that teachers were not ready to implement courageous learning policies.

Sulisworo (Sulisworo & Hidayati, 2021) found that the Teachers' technology readiness level causes polarization of technological segmentation at which there are no skeptics and paranoids segments. The extent to which

teachers use technology in their classroom instruction has long been a subject of study. Indeed, numerous models explain the influential factors and mechanisms of classroom technology use (Nair & Das, 2012).

In truth, there are still quality gaps in the regions; with online learning made possible by Google, it is believed that it can be accelerated everywhere. This approach can address concerns with teacher quality, undisciplined entry hours, and other technical ones (Mulyani, 2019). To assess teacher technology readiness, the technology readiness index can be used. As for external customers, understanding teacher technology readiness is crucial for making the right choices when designing, implementing, and managing teacher and technology relationships.

Based on the explanation above, studying the crucial factors and looking for the correlation between technological readiness and the acceptance of private teachers regarding understanding the technology readiness index is necessary. This will serve as the cornerstone of a strategy for using digital technology for education, the effectiveness of which can be measured by how much educators and policymakers have accepted it (according to the technology acceptance model). This study estimates the teacher readiness index and technology acceptance to provide a The Model of Influence of Optimism, Innovativeness, Discomfort, and Insecurity on Perceived Ease to Use and Perceived Usefulness.

RESEARCH METHODS

This study uses a quantitative approach, which is included in this type of correlational research (Donald et al., 2010). This study measures the effect of the independent variable on the dependent variable using modeling analysis using SEM Amos (Byrne, 2010). This study was conducted at private schools in Bandung, Indonesia. This research involved 185 private teacher respondents from Bandung City.The instrument used to measure the technology readiness index (TRI) and TRAM was a questionnaire with Likert scales ranging from 1 to 5 (from disagree to agree from Parasuraman & Colby (2001; 2015). The questionnaire was translated from English into Indonesian. Then, it was validated before it was used. While there were four factors of TRI: optimism (OPT, four items), innovativeness (INN, four items), discomfort (DIS, four items), and insecurity (INS, four items), there were two factors of TRAM: perceived ease of use and perceived of usefulness. The research conceptual framework can be seen in Figure 1 below:

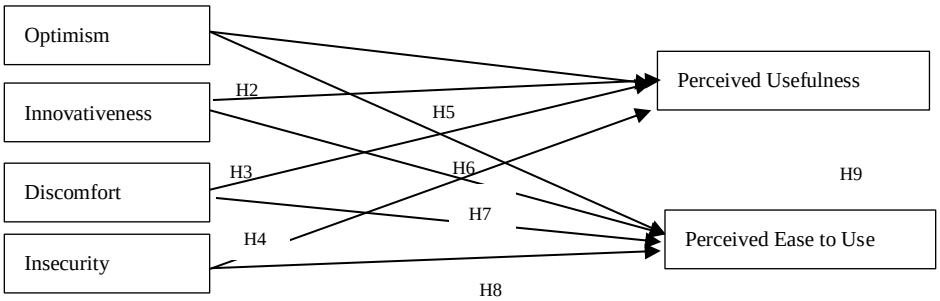

Figure 1. Research hypothesis

RESULTS AND DISCUSSION

Validity Testing

Validity testing was done by looking at the value of the loading factor for each indicator. Based on Table 1, it can be concluded that the loading factor value (P) for all of them was above 0.5, meaning that all indicators met the validity criteria.

Table 1. Loading Factor Value

			Estimate	S.E.	C.R.	P	Label
OPT4	<---	Optimism	.930	.032	29.136	***	par_1
OPT3	<---	Optimism	.936	.031	30.375	***	par_2
OPT2	<---	Optimism	1.007	.034	29.475	***	par_3
OPT1	<---	Optimism	1.000				
INO4	<---	Innovativeness	1.000				
INO3	<---	Innovativeness	.943	.046	20.451	***	par_4
INO2	<---	Innovativeness	.915	.042	21.758	***	par_5
INO1	<---	Innovativeness	.978	.048	20.353	***	par_6
DIS4	<---	Discomfort	1.000				
DIS3	<---	Discomfort	.987	.054	18.163	***	par_7
DIS2	<---	Discomfort	.906	.063	14.275	***	par_8
DIS1	<---	Discomfort	.674	.071	9.429	***	par_9
INS4	<---	Insecurity	1.000				
INS3	<---	Insecurity	1.065	.135	7.894	***	par_10
INS2	<---	Insecurity	1.000	.133	7.533	***	par_11
INS1	<---	Insecurity	.665	.118	5.645	***	par_12
PUS1	<---	Perceived_Usefullness	1.000				
PUS2	<---	Perceived_Usefullness	.953	.032	29.739	***	par_13
PUS3	<---	Perceived_Usefullness	.924	.033	27.919	***	par_14
PUS4	<---	Perceived_Usefullness	.969	.027	36.064	***	par_15
PUS5	<---	Perceived_Usefullness	.992	.027	36.851	***	par_16
PUS6	<---	Perceived_Usefullness	1.004	.037	27.097	***	par_17
PEU1	<---	Perceived_Ease_of_Use	1.000				
PEU2	<---	Perceived_Ease_of_Use	.975	.037	26.360	***	par_18
PEU3	<---	Perceived_Ease_of_Use	.995	.036	27.579	***	par_19
PEU4	<---	Perceived_Ease_of_Use	1.074	.041	26.061	***	par_20
PEU5	<---	Perceived_Ease_of_Use	1.093	.042	26.270	***	par_21
PEU6	<---	Perceived_Ease_of_Use	1.029	.041	25.353	***	par_22

Testing Construct Reliability and Variance Extracted

calculated using the formula

$$Construct\ reliability = \frac{(\sum std.loading)^2}{(\sum std.loading)^2 + \sum e_i}$$

$$Vartheiance\ extracted = \frac{\sum std.loading^2}{\sum std.loading^2 + \sum e_i}$$

The results of the reliability calculation can be seen in Table 2.

Table 2. Results of Construct Reliability and Variance Extracted Calculation

Variable	Indicator	Standard Loading (Loading Factor)	Standard Loading^2	Measurement Error (1-Std Loding^2)	Construct Reliability	Variance Extracted
Optimism	OPT4	0.965	0.931225	0.068775	0.98321	0.936063
	OPT3	0.97	0.9409	0.0591		
	OPT2	0.965	0.931225	0.068775		
	OPT1	0.97	0.9409	0.0591		
Innovativeness	INO4	0.934	0.872356	0.127644	0.970103	0.890263
	INO3	0.942	0.887364	0.112636		
	INO2	0.957	0.915849	0.084151		
	INO1	0.941	0.885481	0.114519		
Discomfort	DIS4	0.947	0.896809	0.103191	0.913338	0.727714
	DIS3	0.915	0.837225	0.162775		
	DIS2	0.842	0.708964	0.291036		
	DIS1	0.684	0.467856	0.532144		
Insecurity	INS4	0.729	0.531441	0.468559	0.814381	0.527371
	INS3	0.784	0.614656	0.385344		
	INS2	0.804	0.646416	0.353584		
	INS1	0.563	0.316969	0.683031		
Perceived Usefulness	PUS1	0.965	0.931225	0.068775	0.990919	0.947888
	PUS2	0.971	0.942841	0.057159		
	PUS3	0.963	0.927369	0.072631		
	PUS4	0.991	0.982081	0.017919		
	PUS5	0.993	0.986049	0.013951		
	PUS6	0.958	0.917764	0.082236		
Perceived Ease of Use	PEU1	0.958	0.917764	0.082236	0.986693	0.925139
	PEU2	0.963	0.927369	0.072631		
	PEU3	0.969	0.938961	0.061039		
	PEU4	0.961	0.923521	0.076479		
	PEU5	0.963	0.927369	0.072631		
	PEU6	0.957	0.915849	0.084151		

Based on the calculation results in Table 2, it can be concluded that the construct reliability values of the six variables are as follows: optimism with 0.98321, innovativeness with 0.970103, discomfort with 0.913338, insecurity with 0.814381, perceived usefulness with 0.990919, and perceived ease of use with 0.986693. The value of the six was more significant than the cut-off value of 0.7, so the indicators had high consistency.

Meanwhile, for the variance extracted, optimism was 0.936063, innovativeness was 0.890263, discomfort was 0.727714, insecurity was 0.52737, perceived usefulness was 0.947888, and perceived ease to use was 0.925139. Since the value of the six was higher than 0.5, the variance extracted from the indicators was more significant for the formation of latent variables.

SEM Assumption Test

1. Univariate and Multivariate Normality

With a sample size of 185 respondents, the normality calculation results are as follows:

Table 3. Normality Calculation Results 1

Variable	min	max	skew	c.r.	kurtosis	c.r.
PEU6	1.000	5.000	-.431	-2.392	-.207	-.575
PEU5	1.000	5.000	-.582	-3.231	-.228	-.633
PEU4	1.000	5.000	-.476	-2.645	-.392	-1.090
PEU3	1.000	5.000	-.312	-1.731	-.378	-1.049
PEU2	1.000	5.000	-.304	-1.687	-.446	-1.237
PEU1	1.000	5.000	-.410	-2.277	-.176	-.488
PUS6	1.000	5.000	-1.033	-5.738	.005	.014
PUS5	1.000	5.000	-.845	-4.690	-.310	-.859
PUS4	1.000	5.000	-.816	-4.530	-.230	-.638
PUS3	1.000	5.000	-.654	-3.632	-.476	-1.321
PUS2	1.000	5.000	-.793	-4.401	-.299	-.830
PUS1	1.000	5.000	-.835	-4.637	-.408	-1.133
INS1	1.000	5.000	.019	.103	.065	.181
INS2	1.000	5.000	.372	2.065	-.041	-.115
INS3	1.000	5.000	.139	.772	-.332	-.921
INS4	1.000	5.000	.312	1.732	-.074	-.205
DIS1	1.000	5.000	.287	1.596	-.327	-.908
DIS2	1.000	5.000	.497	2.759	-.137	-.379
DIS3	1.000	5.000	.475	2.638	-.150	-.417
DIS4	1.000	5.000	.414	2.299	-.040	-.110
INO1	1.000	5.000	-.324	-1.800	-.634	-1.760
INO2	1.000	5.000	-.319	-1.770	-.514	-1.427
INO3	1.000	5.000	-.397	-2.205	-.465	-1.292
INO4	1.000	5.000	-.586	-3.251	-.343	-.954
OPT1	1.000	5.000	-.842	-4.675	-.372	-1.032
OPT2	1.000	5.000	-1.064	-5.909	.053	.148
OPT3	1.000	5.000	-.783	-4.345	-.248	-.689
OPT4	1.000	5.000	-.803	-4.457	-.222	-.616
Multivariate					168.790	28.006

It may be deduced from the normality test results in Table 3 that the critical ratio (cr) value was more significant than -2.5 cr 2.5 (or rounded to 3). It indicates that the data complied with the normality criteria. The multivariate cr value of 28.006 was significantly higher than 3 (2.5). The next step was to employ ML (maximum likelihood) estimation by performing outlier identification with Mahalanobis because the sample was in the 100–200 range.

In increasing the data normality, the elimination of outlier data was carried out. The measure used was elimination, which was done if p2 <0.05. After elimination, the number of samples was 121. Furthermore, the normality was tested again, and the calculation results were obtained as follows:

Table 4. Normality Calculation Results 2

Variable	min	max	skew	c.r.	kurtosis	c.r.
PEU6	1.000	5.000	-.487	-2.185	-.323	-.725
PEU5	1.000	5.000	-.541	-2.431	-.442	-.992
PEU4	1.000	5.000	-.518	-2.328	-.489	-1.098
PEU3	1.000	5.000	-.411	-1.844	-.468	-1.051
PEU2	1.000	5.000	-.401	-1.802	-.492	-1.104
PEU1	1.000	5.000	-.411	-1.845	-.362	-.814
PUS6	1.000	5.000	-.777	-3.488	-.547	-1.229
PUS5	1.000	5.000	-.688	-3.089	-.614	-1.378
PUS4	1.000	5.000	-.666	-2.991	-.613	-1.377
PUS3	1.000	5.000	-.538	-2.416	-.736	-1.652
PUS2	1.000	5.000	-.674	-3.028	-.595	-1.335
PUS1	1.000	5.000	-.693	-3.111	-.753	-1.690
INS1	1.000	5.000	.071	.318	.416	.934
INS2	1.000	5.000	.275	1.236	.030	.068
INS3	1.000	5.000	.135	.607	-.208	-.468
INS4	1.000	5.000	.367	1.649	.137	.309
DIS1	1.000	5.000	.345	1.547	-.158	-.356
DIS2	1.000	5.000	.595	2.672	.349	.783
DIS3	1.000	5.000	.476	2.140	.157	.353
DIS4	1.000	5.000	.587	2.636	.509	1.144
INO1	1.000	5.000	-.359	-1.611	-.686	-1.540
INO2	1.000	5.000	-.464	-2.082	-.364	-.817
INO3	1.000	5.000	-.459	-2.060	-.460	-1.032
INO4	1.000	5.000	-.556	-2.495	-.510	-1.146
OPT1	1.000	5.000	-.749	-3.366	-.639	-1.435
OPT2	1.000	5.000	-.886	-3.978	-.404	-.908
OPT3	1.000	5.000	-.737	-3.308	-.412	-.926
OPT4	1.000	5.000	-.698	-3.133	-.524	-1.176
Multivariate					90.438	12.136

Based on the normality test results in Table 4, the data can be univariately standard since all cr values were above -2.5 ≤ cr ≤ 2.5, while the multivariate cr value was 12.136, still above 2.5 (3). Since the number of samples was close to 100, and it was impossible to do the second Mahalanobis test, the bootstrapping method was then used (Arbuckel & Wothke, 1999; Boomsma, 2000).

2. Boollen-Satine Bootstrap

The Bollen-Stine bootstrap results from the research sample are as follows:

Bollen-Stine Bootstrap (Default model)
The model fits better in 199 bootstrap samples.
It fits about equally well in 0 bootstrap samples.
It fits worse or fails to fit in 1 bootstrap sample.
Testing the null hypothesis that the model is correct, Bollen-Stine bootstrap p = .010

The 200 bootstrap samples yielded findings that one sample was unsuitable (filed). Therefore, the Bollen-Stine test findings generated a probability value (p) of 0.010 (199/121). With a chi-square value of 619.820 and a probability of 0.000 (still below 0.05), these results differed from the initial sample without Bootstrap. Hence, it can be concluded that the fit model was accepted based on the calculation of the Bollen-Satine bootstrap probability value of 0.010 (> 0.05). The following is the Histogram 1 representation of the bootstrap distribution:

Histogram 1. ML Discrepancy (Implied Vs. Sample) (Default Model)

```
                                |--------------------
                    255.105     |**
                    286.837     |******
                    318.568     |***************
                    350.300     |***************
                    382.031     |******************
                    413.763     |******************
                    445.494     |***************
N = 200             477.226     |******
Mean = 392.280      508.957     |**
S. e. = 4.597       540.689     |***
                    572.420     |
                    604.152     |
                    635.883     |
                    667.615     |
                    699.346     |*
                                |--------------------
```

b. Model Test

After the research data met the criteria for normality, a test of the model developed was carried out based on the research hypothesis based on concepts and theories. The model test results are shown in Figure 2:

Based on the structural model analysis results in Figure 2, the feasibility of the model could be tested using several criteria, as presented in Table 5.

Table 5. Model Feasibility Test Index (Goodness of Fit Index)

The goodness of the fit index	Cut-off value	Model Results	Description
Chi-square	Expected small	619.585	Marginal
Probability	≥0.05	0.010 (*Bollen-Stien Bootstrap*)	Good
RMSEA	≤0.08	0.084	Good
GFI	≥0.90	0.755	Marginal
AGFI	≥0.90	0.686	Marginal
CFI	≥0.90	0.953	Good
TLI	≥0.90	0.947	Good
NFI	≥0.90	0.903	Good

Based on the eight criteria of model feasibility testing in Table 5 above, three criteria, namely Chi-Square (because it is susceptible to sample size, it requires another test), GFI, and AGFI, were in the marginal category, while the other five criteria, namely RMSEA, CFI, TLI, and NFI, were in a suitable category. It implies that the model proposed in the hypothesis was fit with the data. Furthermore, the model could test research hypotheses based on regression values and correlations or covariances.

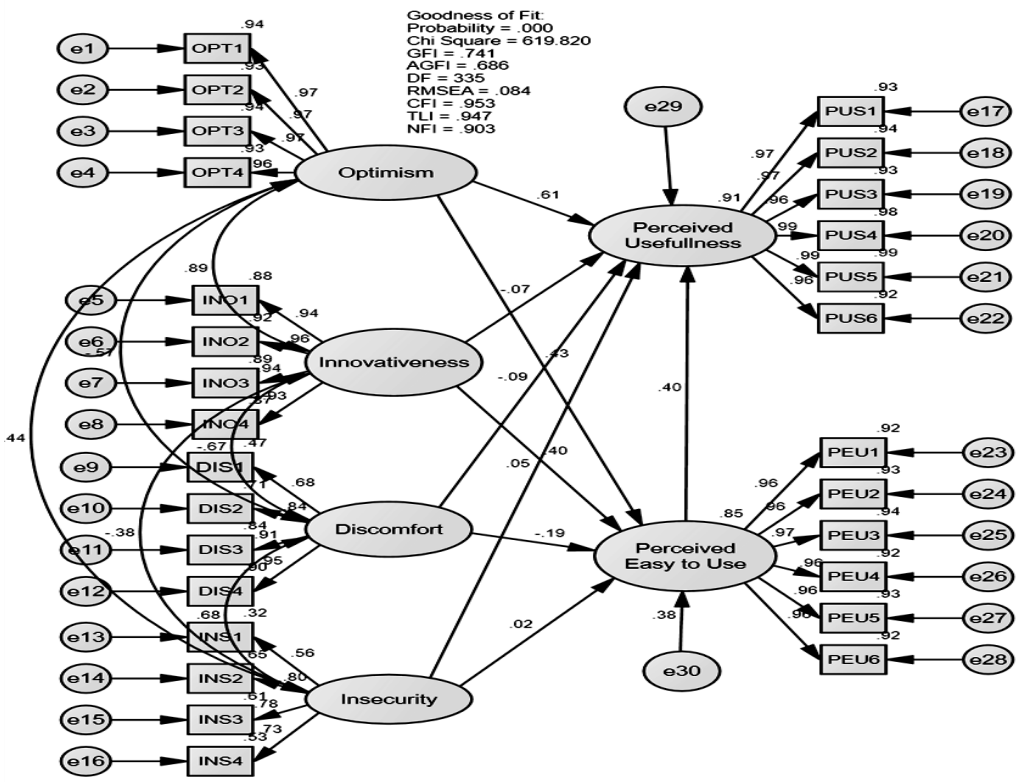

Figure 2. The Model of Influence of Optimism, Innovativeness, Discomfort, and Insecurity on Perceived Ease to Use and Perceived Usefulness

1. Correlation Test

To determine the closeness of the relationship between variables in the study (model), it can be seen based on the covariance results as follows:

Table 6. Covariances: (Group Number 1 - Default Model)

			Estimate	S.E.	C.R.	P	Label
Optimism	<-->	Innovativeness	1.108	.160	6.930	***	par_31
Innovativeness	<-->	Discomfort	-.611	.106	-5.765	***	par_32
Discomfort	<-->	Insecurity	.429	.086	5.008	***	par_33
Optimism	<-->	Discomfort	-.627	.120	-5.242	***	par_34
Innovativeness	<-->	Insecurity	-.273	.082	-3.344	***	par_35
Optimism	<-->	Insecurity	-.376	.100	-3.772	***	par_36

Based on Table 6, it can be concluded that:

a. Optimism and innovativeness had a significant correlation, meaning that the higher a person's optimism, the more innovative, and vice versa.
b. Discomfort and innovativeness had a significant negative correlation, meaning that the higher a person's discomfort, the less innovative, or the less innovative a person is, the more uncomfortable.
c. Discomfort and insecurity had a significant positive correlation, meaning that the more uncomfortable a person is, the more insecure they feel, and vice versa.
d. Optimism and discomfort had a significant negative correlation. It indicates that the higher a person's optimism, the lower the feeling of discomfort, and vice versa.
e. Innovativeness and insecurity had a significant negative correlation, meaning that the higher a person's innovativeness, the lower the insecurity, and vice versa.
f. Optimism and insecurity had a significant negative correlation, meaning that the higher a person's optimism, the lower his insecurity (feeling insecure), and vice versa.

Regression Test

Finding out whether there was an influence of the independent (exogenous) variable on the dependent (endogenous) variable can be seen in Table 7.

Table 7. Regression Weights: (Group Number 1 - Default Model)

			Estimate	S.E.	C.R.	P	Label
Perceived_Easy_to_Use	<---	Insecurity	.032	.095	.336	.737	par_24
Perceived_Easy_to_Use	<---	Optimism	.330	.080	4.124	***	par_25
Perceived_Easy_to_Use	<---	Innovativeness	.370	.110	3.374	***	par_27
Perceived_Easy_to_Use	<---	Discomfort	-.198	.088	-2.263	.024	par_30
Perceived_Usefullness	<---	Optimism	.617	.094	6.584	***	par_23
Perceived_Usefullness	<---	Innovativeness	-.089	.122	-.729	.466	par_26
Perceived_Usefullness	<---	Discomfort	-.128	.095	-1.349	.177	par_28
Perceived_Usefullness	<---	Insecurity	.094	.100	.937	.349	par_29
Perceived_Usefullness	<---	Perceived_Easy_to_Use	.528	.114	4.638	***	par_37

The results of the hypothesis testing may be summarized in the following statement in light of the regression analysis in the Table 8:

Based on the hypothesis testing results on several variables in the table above, most variables influenced perceptions of the ease of technology and the benefits of technology. The variables that influenced and did not affect the two perceptions are described as follows:

1. User insecurity had no significant positive effect on the perceived ease of technology.
2. User optimism significantly positively affected the perceived ease of technology.

3. The innovativeness of users had a significant positive effect on the perceived ease of technology.
4. User discomfort had a significant negative effect (0.05) on the perceived ease of technology.
5. User optimism had a significant positive effect on the perceived usefulness of technology.
6. The innovativeness of users had no significant negative effect on the perception of the usefulness of technology.
7. User discomfort had no significant negative effect on the perceived usefulness of technology.
8. User insecurity had no significant positive effect on the perception of the usefulness of technology.
9. Perceived ease of use of technology had a significant positive effect on the perceived usefulness of technology.

Table 8. Summary of Research Hypothesis Test Results (Model)

Variable	Regression Weigh	Description
Optimism -> Perceived ease to use	0.330	Positive-significant
Innovativeness -> Perceived ease to use	0.370	Positive-significant
Discomfort -> Perceived ease to use	-0.198	Negative-significant (0.05)
Insecurity -> Perceived ease to use	0.032	Positive-not significant
Optimism -> Perceived usefulness	0.617	Positive-significant
Innovativeness -> Perceived usefulness	-0.089	Negative-not significant
Discomfort -> Perceived usefulness	-0.128	Negative-not significant
Insecurity -> Perceived usefulness	0.094	Positive-not significant
Perceived ease to use-> Perceived usefulness	0.528	Positive-not significant

H1: User optimism affects the perception of the usefulness of technology

The user optimism variable consisted of four indicators. Based on the study results, the user optimism variable had a positive and significant effect on the perceived usefulness of technology, with a value of 0.617. The results of this study indicate that the hypothesis was accepted, i.e., user optimism influenced the perception of the usefulness of technology.

The research results agree that optimism positively influenced the perceived benefits of using this technology (Pradana, 2021). However, it differs from the opinion that optimism has no significant effect on perceived benefits (Andayani & Ono, 2020). Based on the research results and discussion, it can be concluded that user optimism had a positive and significant effect on the perception of the usefulness of technology. The higher the optimism of technology users, the higher the perception of the benefits of technology. Technology users in this research were teachers. A teacher with high optimism would affect his perception of the use of technology. Optimism is also a teacher's

view of the benefits of the technology used, where these benefits are used in the learning process and other activities.

H2: The innovativeness of users influences the perception of the usefulness of technology

Four indications made up the user innovativeness variable. According to the study's findings, the user's innovativeness variable had a -0.089 value and had a negative, inconsequential impact on people's opinions of technology's value. The results of this study suggest that it was not true that innovativeness affected people's perceptions of how valuable technology was.

Accordingly, innovative improvements could raise perceptions of the advantages of using technology. The results are consistent with those that found that innovativeness influenced perceptions of the usefulness of technology (Nahzdifah et al., 2022). Users will be more inclined to utilize technology if there is a high level of innovation (Harianja et al., 2023). Based on the findings and analysis of the research, it can be said that consumers' innovativeness had a negative and negligible impact on how beneficial they perceived technology to be. Technology may be used in life and the classroom by someone with high levels of inventiveness.

H3: User discomfort influences the perception of the usefulness of technology.

The user discomfort variable encompassed four indicators. Based on the study results, the user discomfort variable had a negative and insignificant effect on the perception of the usefulness of technology, with a value of -0.128. The results of this study indicate that the hypothesis was rejected, i.e., user discomfort affected the perception of the usefulness of technology.

The research results corroborate the statement that discomfort did not affect usefulness (Rosmayanti et al., 2018). The results of this study are not in line with the statement, which states that the discomfort of technology users had a significant effect on the benefits of technology (Rifai et al., 2019). Based on the research results and discussion, it can be concluded that user discomfort had a negative and insignificant effect on the perception of the usefulness of technology. Thus, the discomfort felt by the teacher had no effect on his perception of understanding that the technology used has benefits for its users.

H4: User insecurity affects the perception of the usefulness of technology.

Four indicators made up the user insecurity variable. According to the study's findings, the user's insecurity variable, with a value of 0.094, had no appreciable beneficial impact on the perceived usefulness of technology. The findings of this study imply that the hypothesis that user insecurity affects perceptions of the value of technology was accepted.

The findings are consistent with a prior study, which revealed that perceived advantages of the technology employed were positively impacted by insecurity (Hadisuwarno & Bisma, 2020). It may be inferred from the research findings and discussion that user insecurity had a favorable but negligible impact on how valuable people considered technology. In connection with this, consumers will not utilize technology as much if they feel insecure about how it

will affect their security. Thus, user insecurity affects how users or teachers use technology. Since it stores information about how people use technology, the level of security is essential (Afolo & Dewi, 2022).

H5: User optimism affects the perceived ease of technology.

The user optimism variable comprised four indicators. Based on the study results, the user optimism variable had a significant positive effect on the perceived ease of technology, with a value of 0.330. The results of this study indicate that the hypothesis was accepted, namely, that the user's optimism influenced the perceived ease of technology.

The research results were obtained, which also found that optimism positively influenced assessing the ease of use of technology (Wahyuni et al., 2020). Optimism has a positive and significant effect on perceived ease of use (Panday et al., 2019). Based on the research results and discussion, it can be concluded that user optimism influenced the perceived ease of technology. The higher the optimism that technology users have, the higher the perception of the ease of use of the technology. Hence, a teacher with high innovation will have the perception that new technology is easy to use.

H6: Innovativeness of users affects the perceived ease of technology.

There were four indications for the user innovativeness variable. According to the study's findings, the user's innovativeness variable, with a value of 0.370, had a favorable and substantial impact on how easily technology was regarded. The findings of this study indicate that the hypothesis, according to which the user's inventiveness impacted the perception of technological ease, was accepted.

The research findings concur with a study that discovered innovativeness affected user-friendly technology (Nahzdifah et al., 2022). In a different research, innovativeness did not significantly impact the perceived ease of utilizing technology (Andayani & Ono, 2020). It is clear from the research's findings and analysis that consumers' inventiveness impacted how easily they regarded technology to be used. The perception of technology's usability increases with consumers' level of innovation.

H7: User discomfort influences the perceived ease of technology.

The user discomfort variable consisted of four indicators. Based on the study results, the variable user discomfort had a negative and significant effect on the perceived ease of technology, with a value of -0.198. The results of this study suggest that the hypothesis was rejected; namely, discomfort affected the perception of convenience.

The research results showed that discomfort negatively and significantly affected the ease of technology use (Faizani & Indriyanti, 2021). Innovative people have minimal obstacles in mastering new technology (Hadisuwarno & Bisma, 2020). Based on the research results and discussion, it can be concluded that user discomfort had a negative but significant (0.05) effect on the perceived ease of technology. The higher the discomfort of technology users, the lower the perception of the convenience of the technology.

H8: User insecurity affects the perceived ease of technology.

User insecurity encompassed four indicators. According to the study's findings, the variable user insecurity, which had a value of 0.032, had no discernible beneficial influence on how easily people viewed using technology. The findings of this study demonstrate that the hypothesis, according to which user insecurity had an impact on how easily technology was perceived, was approved.

Users who feel insecure about technology can still feel the ease of technology for several reasons, including not being used to using technology and users feeling that technology is challenging to use and insecure (Rifai et al., 2019). If all technology users think that technology can maintain data confidentiality, users are interested in the ease of use of this technology (Dewi, 2019). Based on the research results and discussion, it can be concluded that user insecurity had a positive but insignificant effect on the perceived ease of technology.

H9: The user's perceived ease of technology influences the perceived usefulness of technology.

The user's perceived ease of technology had six indicators. Based on the study results, the variable perceived ease of use of technology had a positive and significant effect on the perceived usefulness of technology, with a value of 0.528. The results of this study imply that the hypothesis was accepted; in other words, the user's perceived ease of technology influenced the perceived usefulness of technology.

The research results are consistent with the statement that perceived ease of technology influences perceptions of the usefulness of technology (Widaningsih & Mustikasari, 2022). The higher a teacher's perception of technology, the higher the utilization of this technology (Hudayati et al., 2021). It denotes that if the teacher has the perception that technology is easy to use, it will affect his perception of the benefits of using technology. Based on the research results and discussion, it can be concluded that the user's perceived ease of technology positively and significantly affected its perceived usefulness. The higher the perception of the convenience of technology, the higher a person's perception of the benefits of the technology.

CONCLUSION

Based on the analysis of research data and the discussion carried out in this study, it can be concluded that of the four variables, some influenced the perceived ease of technology and the perceived usefulness of technology. Optimism and innovativeness positively and significantly affected the ease of technology. Hence, the higher the teacher's optimism and innovativeness, the higher the ease of technology he will feel. Conversely, the higher the discomfort of a teacher will further reduce the perception of the ease of technology, or discomfort has a significant adverse effect on the perception of the ease of technology. Meanwhile, the insecurity variable had an insignificant positive effect on the perceived ease of technology.

Only optimism had a significant positive effect when associated with the benefits of technology. Meanwhile, innovativeness and discomfort did not affect

the use of technology. It indicates that the usefulnusehnology is only determined by the teacher's optimism as its user. The ease of use of technology felt by teachers influenced their perception of the value of the benefits of the technology. Therefore, to increase the benefits of technology, it is necessary to increase teachers' perceptions of the convenience of technology and their optimism. Then, to increase the ease of technology, it is necessary to increase the optimism and innovativeness of teachers. It is the opportunities for the next reserch to find how otp increase teachers' the optimism and innovatioveness .

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