

E-Training and Perceived Organizational Performance in Bangladeshi Banks: The Mediating Role of Employee Competency

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ABSTRACT

Evaluating e-training through organizational performance alone leaves the contribution of employee competency unclear. This study examines whether employee competency helps explain the effect of e-training on perceived organizational performance in Bangladeshi banks. Questionnaire data from 375 employees of BRAC Bank, Community Bank, and ONE Bank were analyzed using partial least squares structural equation modeling. E-training had significant positive estimated effects on employee competency and perceived organizational performance. Employee competency also had a significant positive effect on perceived performance. The indirect effect through competency was 0.163, with a 95% confidence interval of 0.115–0.221. A significant direct effect of 0.248 remained, supporting partial mediation. Together, e-training and competency explained 26.7% of the variation in perceived performance. The study adds a competency pathway to the evaluation of e-training in the selected banking institutions, showing that competency explains part, but not all, of the modeled training-performance effect. For managers, the findings support combining employees' assessments of training with evidence of capability development, rather than relying on participation alone.

KEYWORDS: E-training; Employee Competency; Perceived Organizational Performance; Mediation; Banking; Bangladesh

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1. Introduction

For banks investing in e-training, a favorable assessment of an online course is only one part of the evaluation. Managers also need to know whether training is connected with employee capability and whether that capability helps explain organizational outcomes. Training research distinguishes learning from the application and maintenance of learning at work (Baldwin & Ford, 1988). That distinction makes employee competency relevant to the evaluation of digital training: a training-performance relationship alone leaves the contribution of capability unspecified.

Research on e-training has examined different stages of this evaluation. Ramayah et al. (2012) studied satisfaction, continued use, and net benefits in Malaysian multinational companies. Kumar and Kumar (2023) examined trainee experience and self-assessment in the Indian power sector. These studies establish useful approaches to evaluating electronic learning, but their outcomes do not constitute the same construct as perceived organizational performance. The present study places employee competency between employees' evaluation of e-training and their assessment of organizational outcomes, while retaining a direct training-performance path.

The choice of mediator also draws on research beyond electronic training. Potnuru and Sahoo (2016) examined HRD interventions, employee competencies, and organizational effectiveness in manufacturing. Banking studies have examined HRM practices as antecedents of competency and competencies as predictors of organizational performance (Salman et al., 2020, 2023). Training research in Bangladesh has also considered employee performance (Al Karim, 2019). Taken together, this work motivates a more focused question for the selected banks: how much of the modeled e-training effect on perceived organizational performance is represented by employee competency, and does a direct effect remain?

The paper contributes a joint evaluation of e-training and employee capability in these institutions. Estimating both direct and indirect effects distinguishes the part of the training-performance relationship represented by competency from the part left outside that mediator. Human capital theory supplies the rationale for capability development, while the resource-based view explains why human capabilities matter to organizational functioning. The contribution lies in applying this distinction to e-training and employee-reported organizational outcomes in the selected banks, with explicit measurement and sampling boundaries.

1.1 Research objectives

The overall objective is to assess the effect of e-training on perceived organizational performance in three Bangladeshi banks, with particular attention to the mediating role of employee competency. The study estimates the direct effect of e-training and its indirect effect through competency using employee-reported measures.

The specific objectives are to:

- i. Examine the effect of e-training on employee competency.
- ii. Examine the effect of employee competency on perceived organizational performance.

- iii. Assess the direct effect of e-training on perceived organizational performance after accounting for employee competency.
- iv. Assess the indirect effect of e-training on perceived organizational performance through employee competency.

1.2 Research questions

The study addresses four questions corresponding to the specific objectives:

RQ1: What is the effect of e-training on employee competency?

RQ2: What is the effect of employee competency on perceived organizational performance?

RQ3: Does e-training have a direct effect on perceived organizational performance after accounting for employee competency?

RQ4: Does employee competency mediate the effect of e-training on perceived organizational performance?

These questions are addressed through the direct and indirect paths of the specified PLS-SEM model.

2. Literature Review

2.1 E-training

E-training delivers employee learning through electronic tools and platforms. Studies of its effectiveness differ in what they assess. Wolor et al. (2020), for example, examined e-training alongside e-leadership and work-life balance in relation to employee performance. Kamal et al. (2016) examined infrastructure, efficiency, and methods in a study of e-training and employee performance in Bahrain. The present study adopts those three areas to represent employees' evaluation of training provision, rather than treating access to a platform as evidence of training effectiveness.

Training transfer concerns applying and maintaining what is learned in the work setting (Baldwin & Ford, 1988). This distinction helps explain why course access, perceived capability, and work outcomes should be assessed separately. The current competency measure captures employees' reported capabilities; it does not independently observe the transfer of training to job tasks.

Infrastructure provides the technical foundation for access to training, including reliable connectivity, appropriate equipment, and support. In a banking setting, learning platforms need to fit employees' work arrangements and permit access to relevant material. A platform that is difficult to access may limit the opportunity to learn even when the training content is suitable (Kamal et al., 2016).

Efficiency concerns how effectively the training process addresses learning needs and organizational objectives. Flexible delivery may reduce some scheduling constraints, but the value

of training also depends on whether employees can understand the material and apply it. The present study treats efficiency as part of employees' assessment of e-training rather than as an independently measured financial return (Kamal et al., 2016).

Methods concern the means used to present material and support learning. The choice of delivery approach should take account of employees' tasks and learning requirements. Electronic delivery can combine different forms of content and assessment, but the appropriateness of those methods must be considered in relation to the intended competency outcomes (Kamal et al., 2016).

2.2 E-training in the selected banks

2.2.1 BRAC Bank

A 2023 report described BRAC Bank's introduction of Ghoori Learning courses on its ALO platform. The reported course areas included sales, data entry, cybersecurity, business analysis, leadership, and negotiation. The announcement illustrates the provision of professional and soft-skill learning through an online platform (Daily Observer, 2023).

2.2.2 ONE Bank

ONE Bank introduced an e-learning management system offering online teaching, certification examinations, mock examinations, and learning-progress evaluation. These functions show how an online platform can combine access to course material with assessment activities (The Financial Express, 2023).

2.2.3 Community Bank

Community Bank introduced an e-learning management system for employee development. The reported platform provided access to materials such as video presentations, circulars, and relevant laws through office-email authorization (The Business Standard, 2022).

These institutional examples establish the practical context for the study. They do not provide independent estimates of training effectiveness; the empirical analysis instead examines employees' responses to the study questionnaire.

2.3 Employee competency

Employee competency encompasses the knowledge, skills, and capabilities relevant to performing work. Studies have examined its relationship with organizational outcomes in tourism and banking settings (Elbaz et al., 2018; Salman et al., 2020). The present study conceptualizes competency through self-competence, team competence, and communication competence. These areas describe different aspects of employee capability, but the statistical model estimates one overall employee-competency construct.

Self-competence concerns a person's sense of capability and effectiveness. Tafarodi and Swann (1995) distinguish self-competence from self-liking in their measure of global self-esteem. In the present study, adapted items are used to represent employees' perceived competence. This

adaptation does not make the original measure a direct measure of banking performance or of objectively tested job skills.

Team competence concerns employees' ability to contribute to coordinated work with others. Cooperation and collective task performance are particularly relevant where service delivery depends on interconnected roles. Eby and Dobbins (1997) examined collectivistic orientation in teams, while Salman et al. (2020) investigated employee competencies in banks. Their work provides a basis for considering collaborative capability alongside individual competence.

Communication competence concerns effective interaction in work-related settings. Clear exchange of information can support coordination and understanding of responsibilities. The study draws on the communication-competence literature represented by Wiemann (1977) and on research linking employee competencies with organizational effectiveness (Potnuru & Sahoo, 2016). Communication competence is included within the overall competency measure rather than tested as a separate mediator.

2.4 Perceived organizational performance

Organizational performance can be assessed through outcomes at different levels. Dyer and Reeves (1995) distinguish human resource, organizational, financial, and capital-market outcomes. Delaney and Huselid (1996) examine perceptions of organizational performance, while Rowe and Morrow (1999) distinguish accounting, market, and subjective financial measures. These approaches make the source of a performance measure part of its interpretation. Here, employees' assessments of human resource, organizational, and financial outcomes form the perceived organizational-performance construct; the questionnaire does not measure audited financial results or capital-market outcomes.

Human resource outcomes concern employees' assessments of workforce-related results. Such outcomes can help frame how people-management practices relate to the functioning of an organization. In this study, they form part of the perceived organizational-performance construct and should not be interpreted as independently verified changes in turnover, absenteeism, or job satisfaction.

Financial outcomes refer here to employees' assessments of their bank's financial performance. Rowe and Morrow (1999) distinguish subjective financial measures from accounting and market measures. These responses capture employee judgments and do not independently establish profitability, cost savings, or financial returns from training.

Organizational outcomes concern the effectiveness of work processes and service delivery. Considering these outcomes alongside employee competency helps connect the individual and organizational levels conceptually. However, the use of employee reports means that the analysis describes perceptions rather than direct observation of productivity, service quality, or customer satisfaction.

2.5 Evidence synthesis and study focus

The studies reviewed do not treat training experience, competency, and performance as interchangeable outcomes. In Ramayah et al. (2012), satisfaction predicted continued use but did not significantly predict net benefits. Kumar and Kumar (2023) found a positive relationship between trainee experience and self-assessment. The difference matters: a favorable training experience can be evaluated without assuming an equivalent organizational benefit. Including competency and perceived organizational performance in the same model allows the present study to examine these outcomes separately.

Banking evidence also cautions against treating every competency dimension alike. Salman et al. (2020) reported positive effects for selected competencies, while self-competence had a negative, non-significant effect. Salman et al. (2023) reported mixed results across HRM practices and competency dimensions. Their analyses address dimension-level differences. The present model pools the retained indicators into an overall competency construct, so it addresses the mediator's role without identifying which dimension carries the effect. These differences in construct specification guide both the hypotheses and the comparison of findings.

3. Research Framework

Human capital theory explains training as investment in employees' productive capabilities (Becker, 1964). The expected benefit of e-training therefore depends on the capability developed through learning, not simply the availability of an electronic channel. In the present model, e-training represents employees' assessment of infrastructure, efficiency, and methods. Training that employees regard as accessible and useful is expected to support their reported capability. Research on HRM practices and competency in banking offers a relevant empirical basis, although its mixed dimension-level findings show why this expectation requires testing (Salman et al., 2023). H1 predicts a positive effect of e-training on employee competency.

The next path connects capability with perceived organizational performance. Employees' ability to complete tasks, work with colleagues, and communicate can contribute to how organizational work is accomplished. The resource-based view provides a broader rationale for the organizational importance of human resources (Barney, 1991; Wright et al., 1994). Salman et al. (2020) provide banking evidence that selected competencies predict organizational performance, while also showing that the effects differ across dimensions. The current model tests the overall competency construct. H2 predicts a positive effect on perceived organizational performance; it does not imply that every competency dimension has the same effect.

Competency may not represent every route connecting e-training with performance. Training materials can provide guidance for an immediate task as well as support the development of broader capability. The relevance of training design and the conditions surrounding learning is emphasized in the training literature (Salas et al., 2012). These considerations motivate retaining a direct path after competency is included. H3 predicts a positive direct effect of e-training on

perceived organizational performance. The path estimates the remaining model-based effect; the survey does not separately measure the possible processes behind it.

H4 links the first two paths. If e-training contributes to reported capability and capability contributes to perceived performance, competency should carry part of the training-performance effect. Potnuru and Sahoo (2016) examine a related HRD-competency-effectiveness model in manufacturing. The present study tests the pathway for e-training in the selected banks. This proposed role is narrower than training transfer, which concerns applying and maintaining learning at work (Baldwin & Ford, 1988): the competency questionnaire measures reported capability, rather than directly observing its application. H4 predicts a positive indirect effect through competency.

Retaining both paths allows the analysis to distinguish complete mediation from a pattern in which competency explains only part of the modeled effect. Figure 1 presents paths a and b, whose product is the indirect effect, and c', the direct effect after accounting for competency. The analysis uses three overall reflective constructs. The conceptual dimensions inform the measures but are not estimated as separate predictors or mediators. The hypotheses therefore concern the overall constructs.

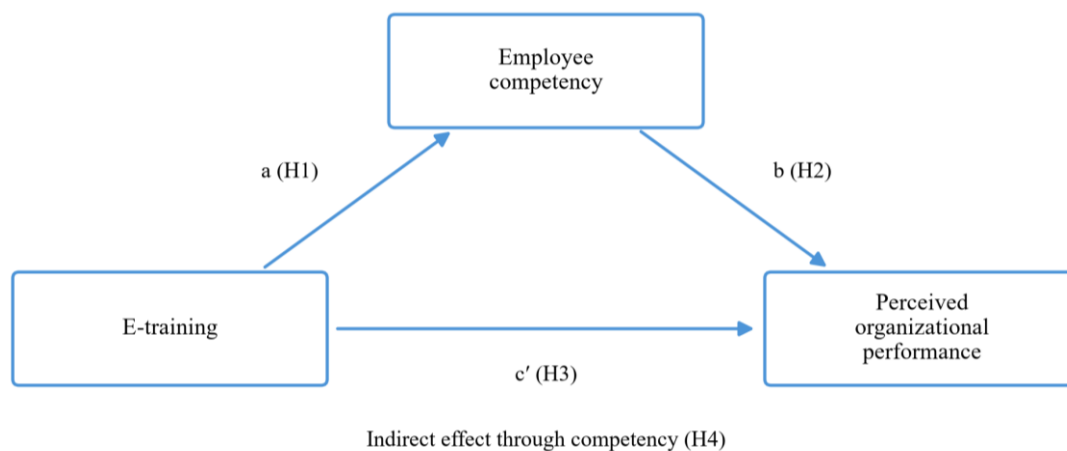


Figure 1 Proposed research framework

3.1 Hypotheses: The hypotheses of this research are as follows:

- H1:** E-training has a positive effect on employee competency.
- H2:** Employee competency has a positive effect on perceived organizational performance.
- H3:** E-training has a positive direct effect on perceived organizational performance after accounting for employee competency.
- H4:** Employee competency mediates the effect of e-training on perceived organizational performance, with a positive indirect effect.

4. Methodology

4.1 Study population and sampling procedures

The study examined employees of three private commercial banks in Bangladesh: BRAC Bank, Community Bank, and ONE Bank. Interviews with representatives of the respective human resource departments during the pilot study provided the employee counts summarized in Table 1. These figures reflect the workforce sizes reported at that time and are subject to staffing changes. Corporate email registries supplied by the participating banks provided the contact lists used to distribute survey invitations. Recruitment followed convenience sampling, with participation determined by employees' accessibility and willingness to respond. An equal target allocation of 125 respondents per bank was intended to obtain participation from each institution, although the allocation was not proportional to their reported workforce sizes.

Table 1 HR-reported employee population and target sample allocation

Banks	HR-reported number of employees	Target sample allocation
BRAC Bank	9,067	125
Community Bank	526	125
ONE Bank	2,555	125
Total	12,148	375

Source: Interviews with representatives of the respective banks' HR departments during the pilot study.

A target sample of 375 respondents was adopted with reference to the sample-size guidance of Krejcie and Morgan (1970), using the combined workforce size reported during the pilot-stage interviews. This guidance served as a planning benchmark rather than establishing statistical representativeness under convenience sampling. Of the 405 questionnaires distributed, 375 were retained following screening for incomplete responses, erroneous answers, and identical responses across all survey items, yielding a usable questionnaire proportion of 92.6%.

4.2 Measures and research instruments

This study examined the relationships among e-training, employee competency, and perceived organizational performance in the banking sector of Bangladesh. Primary data were collected using a structured questionnaire comprising four sections. The first section collected demographic information. The second, third, and fourth sections contained 12 items each to measure e-training, employee competency, and perceived organizational performance, respectively.

All construct-measurement items used the same five-point Likert response format, ranging from 1 (strongly disagree) to 5 (strongly agree). Losby and Wetmore (2012) describe the use of Likert response scales in survey evaluation.

E-training was measured through three dimensions: infrastructure, efficiency, and training methods. The questionnaire items addressing these dimensions were adapted from Kamal et al. (2016).

Employee competency was assessed through self-competence, team competence, and communication competence, drawing on Elbaz et al. (2018), Osei and Ackah (2015), and Otoo and

Mishra (2018). Self-competence items were adapted from Tafarodi and Swann's (1995) global self-esteem measure. Team-related items drew on Eby and Dobbins' (1997) collectivistic-orientation measure, and communication items drew on Wiemann's (1977) communication-competence measure. These adaptations are treated as employee-reported aspects of capability, rather than direct tests of job skills. Their interpretation should retain the distinction between perceived competence, orientation toward teamwork, and independently demonstrated performance.

Perceived organizational performance was measured through three dimensions: human resource outcomes, financial outcomes, and organizational outcomes. Items measuring these dimensions were adapted from Delaney and Huselid (1996), Rowe and Morrow (1999), and Youndt and Snell (2004), respectively.

Employees were the respondents and the units of observation. Perceived organizational performance denotes their assessment of organizational outcomes, including financial outcomes, rather than audited bank-level results. Responses were not aggregated into bank-level observations. Employee competency denotes self-reported capability. The structural effects are estimated at this respondent level.

4.3 Pilot study

Before the main survey, a pilot study was conducted with 30 respondents from the three selected banks to assess the clarity and suitability of the questionnaire. The pilot participants had characteristics similar to those of the intended study sample. Their feedback informed revisions to the questionnaire before its final distribution. Interviews with HR representatives during this phase also provided the workforce figures used for sample-size planning and reported in Table 1.

4.4 Ethical considerations

Respondents provided informed consent before participating in the survey. Participation was voluntary, and respondents were informed of their right to withdraw at any time without coercion. Responses were assigned serial identification numbers to support confidential data handling. Respondents' identities were not disclosed during data collection, analysis, or reporting. Participants were informed that their responses would be analyzed and reported in aggregate form.

4.5 Data collection

Primary data were collected using an adapted, structured questionnaire containing closed-ended questions. The questionnaire was administered through Google Forms, and survey invitations were sent to employees using the corporate email registries provided by the human resource departments of the selected banks.

4.6 Data analysis

Frequencies and percentages summarized the demographic characteristics. Partial least squares structural equation modeling (PLS-SEM) examined the relationships among e-training, employee competency, and perceived organizational performance. The model was estimated in SmartPLS 4 (Ringle et al., 2024), using standardized results and the path-weighting scheme. The algorithm allowed up to 3,000 iterations with a stopping criterion of 10^{-7} . The exported indicator data contained 375 observations for each of the 26 retained items, with responses in the stated range of 1 to 5.

The analysis assessed the reflective measurement model before interpreting the structural paths, following the reporting framework of Hair et al. (2019). Reliability, validities variance extracted, and discriminant validity were examined alongside loadings. Structural assessment considered inner-model collinearity, path coefficients, explained variance, and effect sizes. A two-tailed bootstrap with 5,000 resamples, a fixed-seed setting, and a 5% significance level produced inference for the direct and indirect effects. Percentile 95% confidence intervals are reported. Throughout this article, effect refers to a model-based statistical estimate from the specified PLS-SEM paths. The cross-sectional design does not establish temporal ordering or causal impact; the common-method diagnostic assesses a separate measurement concern.

4.7 Common method variance and bias

A confidentiality assurance was provided to respondents, and shared-method variance was assessed through a statistical diagnostic. Because all three constructs were measured through the same questionnaire and response format, shared-method variance was a relevant concern. A Harman-style single-factor diagnostic was used to assess whether one component dominated the retained item responses. Its interpretation follows the limitations discussed by Min et al. (2016) and Podsakoff et al. (2024).

An unrotated principal component analysis of the correlation matrix used the 26 retained indicators and 375 cases contained in the PLS export. The first component had an eigenvalue of 10.953 and explained 42.13% of the total standardized variance (Appendix 1). This was below the conventional 50% single-component-dominance threshold. The result therefore did not flag a dominant single component under that criterion.

This diagnostic assesses potential shared-method bias in the final indicator set. It was not used to adjust the path coefficients, and its result does not exclude every form of common method bias. The diagnostic implications for cross-sectional study are considered in the limitations.

5. Results and discussion

This section presents the respondents' demographic characteristics and the results of the partial least squares structural equation modeling (PLS-SEM) analysis.

5.1 Respondents' Profile

The demographic profile comprised gender, age, educational qualifications, job position, and work experience. Table 2 describes the 375 retained respondents. The equal bank allocations in Table 1 are recruitment targets; the demographic summaries describe the pooled usable sample.

Table 2: Respondents' Demographic Profile

Characteristic	Category	Frequency	Percentage (%)
Total respondents	—	375	100.00
Gender	Male	220	58.67
	Female	155	41.33
Age (years)	18–30	150	40.00
	31–40	150	40.00
	41–50	45	12.00
	51 and above	30	8.00

Characteristic	Category	Frequency	Percentage (%)
Educational qualifications	Master's degree	300	80.00
	MPhil/PhD	30	8.00
	Professional qualification	45	12.00
Job position	Vice president	30	8.00
	Assistant vice president	45	12.00
	Senior officer	150	40.00
	Officer	150	40.00
Work experience (years)	1–10	195	52.00
	11–20	150	40.00
	21 and above	30	8.00

Source: Field survey, 2025.

Of the 375 respondents, 220 (58.67%) were male and 155 (41.33%) were female. Respondents aged 18–30 and 31–40 each accounted for 40.00% of the sample, followed by those aged 41–50 (12.00%) and 51 or above (8.00%).

Most respondents held a master's degree (80.00%), while 12.00% held professional qualifications and 8.00% held an MPhil or PhD. Officers and senior officers each represented 40.00% of the sample; assistant vice presidents and vice presidents accounted for 12.00% and 8.00%, respectively. Regarding work experience, 52.00% had 1–10 years of experience, 40.00% had 11–20 years, and 8.00% had 21 years or more.

5.2 Measurement model

The PLS-SEM analysis proceeded in two stages: assessment of the measurement model, followed by assessment of the structural model. Mediation was subsequently examined to assess the indirect relationship between e-training and perceived organizational performance through employee competency.

5.2.1 Assessment overview

The reflective measurement model was assessed through indicator loadings, internal consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019). Table 3 presents the final loadings, while Table 4 summarizes construct-level reliability and average variance extracted.

5.2.2 Indicator loadings

Indicator loadings describe the relationship between each reflective indicator and its construct. Loadings above approximately 0.70 provide a useful reference for indicator reliability, although retention decisions should also consider measurement content and construct validity (Hair et al., 2019).

The questionnaire initially contained 12 items for each of the three constructs. The final model excluded ET2, ET6, ET10, EC1, EC8, EC11, EC12, OP4, OP7, and OP9. It retained nine e-training items, eight employee-competency items, and nine organizational-performance items. The final loadings ranged from 0.753 to 0.885. These results concern the retained indicators; the broader conceptual dimensions were not estimated as separate constructs.

Table 3 Retained indicators and loadings

Construct	Indicator	Loading
E-Training	ET1	0.822
	ET3	0.872
	ET4	0.753
	ET5	0.857
	ET7	0.824
	ET8	0.885
	ET9	0.805
	ET11	0.820
	ET12	0.823
Employee competency	EC2	0.825
	EC3	0.816
	EC4	0.771
	EC5	0.859
	EC6	0.773
	EC7	0.833
	EC9	0.829
	EC10	0.842
Perceived performance	OP1	0.757
	OP2	0.866
	OP3	0.760
	OP5	0.792
	OP6	0.784
	OP8	0.860
	OP10	0.801
	OP11	0.766
	OP12	0.864

The removal of ten items narrows the evidence to the final indicator set. Strong retained loadings do not establish that all original dimensions remain adequately represented. The supplied model exports identify the retained items but do not provide their wording or a dimension-to-item map. Content coverage and the choice to pool distinct dimensions therefore remain measurement limitations, even where the reported reliability and discriminant-validity criteria are satisfied.

5.2.3 Internal consistency

Internal consistency was assessed using Cronbach's alpha, rho_a, and composite reliability rho_c. These statistics describe the consistency of the retained indicators within each construct and are reported separately rather than treating rho_a and rho_c as interchangeable (Hair et al., 2019).

Cronbach's alpha was 0.943 for e-training, 0.930 for employee competency, and 0.932 for organizational performance. The corresponding rho_a values were 0.946, 0.933, and 0.938. All three constructs exceeded the 0.70 reference value for internal consistency (Cronbach, 1951; Hair et al., 2019).

Table 4 Construct reliability and convergent validity

Construct	Alpha	rho_a	rho_c	AVE
E-training	0.943	0.946	0.952	0.689
Employee competency	0.930	0.933	0.942	0.671
Perceived performance	0.932	0.938	0.944	0.651

Composite reliability rho_c was 0.952 for e-training, 0.942 for employee competency, and 0.944 for organizational performance. The high values support internal consistency, but e-training's rho_c marginally exceeded 0.95, suggesting that possible item redundancy should be considered. Reliability alone does not demonstrate that the indicators cover every relevant aspect of the constructs or establish that the dimensions are empirically separate.

5.2.4 Convergent validity

Convergent validity was assessed using average variance extracted (AVE). An AVE of at least 0.50 indicates that a construct explains at least half of its indicators' variance on average (Fornell & Larcker, 1981; Hair et al., 2019).

AVE was 0.689 for e-training, 0.671 for employee competency, and 0.651 for organizational performance. All three values exceeded 0.50, supporting convergent validity for the retained reflective measures.

5.2.5 Discriminant validity

Discriminant validity concerns whether the constructs are empirically distinct. The analysis used the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio (Fornell & Larcker, 1981; Henseler et al., 2015). Under this criterion, the square root of each construct's AVE should exceed its correlations with the other constructs.

Table 5 Fornell-Larcker matrix

Construct	ET	EC	OP
E-training (ET)	0.830		
Employee competency (EC)	0.461	0.819	
Perceived performance (OP)	0.411	0.468	0.807

Note: Diagonal entries are the square roots of AVE; off-diagonal entries are correlations.

The diagonal values in Table 5 exceeded the corresponding interconstruct correlations, satisfying the Fornell-Larcker criterion. The square root of e-training's AVE was 0.830, while the corresponding values for employee competency and organizational performance were 0.819 and 0.807.

Table 6 HTMT ratios

Construct pair	HTMT
E-training / employee competency	0.487
E-training / organizational performance	0.434
Employee competency / organizational performance	0.495

HTMT provides an additional assessment of discriminant validity (Henseler et al., 2015). A conservative reference value of 0.85 was used. Table 6 shows HTMT values between 0.434 and 0.495, all below this reference value, supporting separation of the three constructs under this criterion. All reported HTMT values were below 0.85, supporting discriminant validity under the adopted criterion.

5.3 Structural model

The structural model was assessed using inner-model collinearity, path coefficients, coefficients of determination, and effect sizes. The analysis addresses explanatory relationships in the specified model; no claim of out-of-sample predictive performance is made.

5.3.1 Collinearity

Structural collinearity was examined using variance inflation factors (VIFs). The inner-model VIF was 1.000 for e-training predicting employee competency and 1.270 for each predictor of organizational performance. These low values indicate no substantial collinearity concern among the predictors in the specified model (Hair et al., 2019).

Table 7 Inner-model collinearity

Relationship	VIF
ET → EC	1.000
EC → OP	1.270
ET → OP	1.270

5.3.2 Direct effects

Table 8 reports standardized direct effects and bootstrap inference. Two-tailed testing used 5,000 bootstrap resamples and a 5% significance level. Percentile 95% confidence intervals were used to assess whether each estimated effect differed from zero.

Table 8 Direct effects and bootstrap inference

Hypothesis	Path	β	t	p	95% CI
H1	ET → EC	0.461	11.376	< .001	[0.385, 0.544]
H2	EC → OP	0.354	7.273	< .001	[0.255, 0.448]
H3	ET → OP	0.248	4.760	< .001	[0.147, 0.347]

Note: ET = e-training; EC = employee competency; OP = perceived organizational performance. All three hypotheses were supported. CI = percentile bootstrap confidence interval.

E-training had a positive estimated effect on employee competency ($\beta = 0.461$, $t = 11.376$), supporting H1. Employee competency had a positive effect on perceived organizational performance ($\beta = 0.354$, $t = 7.273$), supporting H2. E-training also had a positive direct effect on perceived organizational performance after accounting for competency ($\beta = 0.248$, $t = 4.760$), supporting H3.

All three paths had p values below .001, and their percentile confidence intervals excluded zero. The results support the predicted positive effects in the specified model. Their substantive importance is considered alongside effect sizes and explained variance.

5.3.3 Explained variance

The coefficient of determination (R^2) indicates the variance in an endogenous construct jointly explained by its predictors. Table 9 also reports adjusted R^2 , which accounts for the number of predictors. These values describe in-sample explanatory performance and should be considered in the context of the measures and research setting (Hair et al., 2019).

Table 9 Explained variance

Endogenous construct	R^2	Adjusted R^2
Employee competency	0.213	0.211
Perceived performance	0.267	0.264

E-training explained 21.3% of the variance in employee competency ($R^2 = 0.213$; adjusted $R^2 = 0.211$). E-training and employee competency jointly explained 26.7% of the variance in perceived organizational performance ($R^2 = 0.267$; adjusted $R^2 = 0.264$). Substantial variance remained unexplained, indicating that the model captures part of the relationships rather than a complete account of competency development or organizational outcomes.

5.3.4 Effect sizes

Effect size f^2 indicates the contribution of a predictor to the explained variance of an endogenous construct. Reference values of 0.02, 0.15, and 0.35 are commonly interpreted as small, medium, and large, respectively; these are guidelines rather than universal substantive cutoffs (Hair et al., 2019).

Table 10 Structural effect sizes

Hypothesis	Path	f^2	Interpretation
H1	ET $\rightarrow$ EC	0.270	Medium
H2	EC $\rightarrow$ OP	0.135	Small
H3	ET $\rightarrow$ OP	0.066	Small

E-training had a medium effect size for employee competency ($f^2 = 0.270$). Employee competency and e-training had small effect sizes for organizational performance ($f^2 = 0.135$ and 0.066, respectively). Thus, the effect of e-training on competency was more prominent under this effect-size criterion than the individual contributions to perceived organizational performance.

5.4 Mediation

H4 proposed that employee competency mediates the effect of e-training on perceived organizational performance. Table 11 reports the specific indirect effect, together with the direct and total effects.

Table 11 E-training and perceived organizational performance effects

Effect	β	t	p	95% CI
Indirect (H4)	0.163	6.067	< .001	[0.115, 0.221]
Direct	0.248	4.760	< .001	[0.147, 0.347]
Total	0.411	9.434	< .001	[0.329, 0.498]

The indirect effect was positive and significant ($\beta = 0.163$, $t = 6.067$, $p < .001$), with a percentile 95% confidence interval of [0.115, 0.221]. Its estimate is the product of the e-training-to-competency and competency-to-performance paths, supporting H4. The direct effect remained positive and significant ($\beta = 0.248$), while the total effect was 0.411. The positive direct and indirect effects indicate complementary partial mediation: employee competency explains part of the modeled effect of e-training on perceived organizational performance, while a direct effect remains. Figure 2 presents the final model estimates.

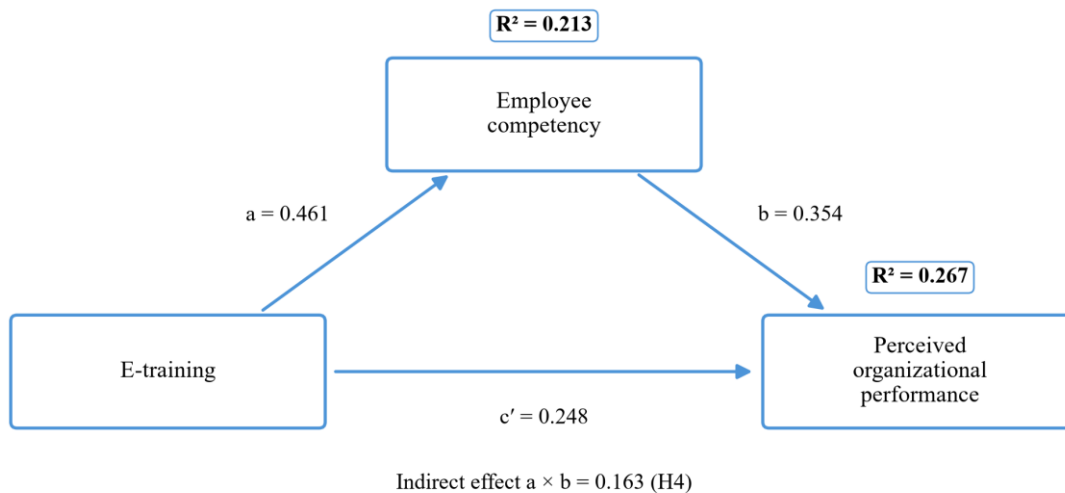


Figure 2 Final structural model effects

5.5 Discussion

Employee competency accounted for part of the modeled effect of e-training on perceived organizational performance. The indirect effect was 0.163, and its 95% confidence interval excluded zero. The direct effect remained positive at 0.248. This complementary partial mediation pattern answers the central research question: including competency explains a component of the training-performance relationship without replacing the direct path. An evaluation confined to either training provision or competency alone would leave out part of the model supported by these data.

The results also clarify the outcome being evaluated. Ramayah et al. (2012) distinguish satisfaction and continued use from net benefits; Kumar and Kumar (2023) examine experience and self-assessment. The present analysis connects an evaluation of training provision with reported competency and perceived organizational performance. It thus evaluates a broader set of employee-

reported outcomes while keeping the constructs separate. Differences in measures, industries, and sampling mean that the studies' coefficients cannot be compared as estimates of a common effect.

The positive overall competency effect is consistent with examining capability as relevant to organizational outcomes, but it should not erase the dimension-level differences found in banking research. Salman et al. (2020) found a negative, non-significant self-competence effect alongside positive effects for selected other competencies. The current result concerns a pooled construct. It therefore neither contradicts that particular dimension result nor establishes that self-competence, teamwork, and communication contribute equally. The mediation finding identifies an overall competency pathway that subsequent item-level and dimension-level research can examine more closely.

Potnuru and Sahoo (2016) connect HRD interventions with competencies and organizational effectiveness in manufacturing. The present findings carry that line of inquiry into an evaluation of electronic training in the selected banks. The extension is specific: e-training is evaluated as a distinct construct, competency is included as a mediator, and both direct and indirect effects on perceived organizational performance are reported. The evidence supports this model in the participating employees; it does not establish a general law about electronic delivery across organizations.

Statistical significance is only part of the result. E-training's contribution to competency had a medium f^2 of 0.270. The separate contributions of competency and e-training to perceived performance had small f^2 values of 0.135 and 0.066. The two predictors explained 26.7% of performance variance. Competency is therefore relevant to the evaluation, but the model leaves much of the variation in performance unexplained. Managers should interpret the significant paths alongside their magnitude, rather than treating a low p value as evidence that training determines organizational performance.

The remaining direct effect is useful because it prevents the competency pathway from being treated as the full explanation. It does not identify a second mechanism. Training quality, opportunities to use learning, or other work conditions are possible subjects for further investigation, rather than processes demonstrated by this survey. Likewise, the study's outcome is perceived organizational performance at the respondent level. An assessment of financial return, bank-level change, or the relative value of classroom and electronic delivery would require a design and measures suited to those questions.

6. Conclusion and implications

6.1 Conclusion

The study shows why employee competency belongs within an evaluation of e-training in the selected banks. All four hypotheses were supported, and competency carried a significant part of the effect on perceived organizational performance while a direct effect remained. The paper's central contribution is this separation of the competency pathway from the remaining training-performance effect in a single model of employee-reported outcomes.

For training evaluation, the result gives capability a defined place between employees' assessment of learning provision and their assessment of organizational outcomes. It also sets a practical boundary: course participation, reported capability, and perceived performance are different forms of evidence. Using them together can improve the questions asked about a program, while independent learning and operational measures are needed to establish the outcomes of particular training decisions.

6.2 Theoretical implications

The findings support the relevance of capability development to the evaluation of e-training. Human capital theory motivates the training-competency path (Becker, 1964), and the significant indirect effect places reported competency within the training-performance model. The evidence does not quantify a return on investment in human capital. It shows that competency explains part of the estimated effect on perceived organizational performance, giving a capability-based interpretation a measurable role in this setting.

The direct effect matters to that interpretation. Because it remains significant, competency is an incomplete account of the modeled training-performance effect. Theoretical explanations of training outcomes should therefore distinguish the capability pathway from other possible routes, rather than assume that one mediator exhausts the relationship. The present design identifies where the model remains incomplete; it does not select among explanations for the residual direct effect.

The resource-based view provides a reason to examine human capabilities as organizationally relevant resources (Barney, 1991; Wright et al., 1994). Here, however, the evidence is about employees' reports, not the rarity or inimitability of a bank's resources. The paper contributes an application of capability reasoning to digital training evaluation. Its contribution is empirical and interpretive: it connects e-training with competency and perceived performance, while preserving the distinction between these outcomes.

6.3 Managerial implications

The competency pathway gives banks a reason to evaluate what employees can do alongside what training they complete. Before launching a program, a training team can specify the job capability the course is intended to develop and choose an assessment that reflects that capability. For example, a course on a banking procedure could be followed by a task demonstration or a review of relevant work. These examples are evaluation options, not interventions tested in this study. The model supports including capability evidence, but it does not identify a particular course or assessment as most effective.

The significant direct effect argues for retaining a separate record of the training experience. Employee feedback on access, content, and delivery can be considered alongside capability assessments and subsequent work outcomes. This makes it possible to examine whether a program is well received, whether its intended capability is evident, and whether the relevant work outcome changes. Satisfaction or completion should not substitute for those other observations. Training-transfer research supports examining the application of learning in the work setting (Baldwin & Ford, 1988).

The small performance effect sizes and the 26.7% explained variance also matter for resource decisions. The findings justify examining training and competency as contributors to perceived performance, rather than treating them as a complete performance-management solution. Banks can select a small set of operational outcomes relevant to a program, record a suitable baseline, and review those outcomes alongside learning evidence. Any decision about cost savings or financial return should use the program's actual costs and outcomes. The present survey does not supply those estimates.

6.4 Limitations and future research

Several limitations define the scope of the findings. First, training, competency, and performance were measured together through employee reports. The common-method diagnostic did not flag single-component dominance: the first component explained 42.13% of variance. However, this result does not establish that all method effects are absent. Assessing shared-method bias also does not resolve temporal ordering, reverse direction, or unmeasured confounding. The direct and indirect effects are estimates within the specified model, rather than proof of causal impact. Cross-sectional mediation may differ from the process observed over time (Maxwell & Cole, 2007).

Second, convenience sampling across three banks limits sector-wide generalization. Equal target allocations were not proportional to the HR-reported workforce sizes, which provide context rather than verified population weights. Email registries do not establish complete coverage of eligible employees. Shared conditions within banks, branches, or teams may create dependence among respondents; individual-level resampling does not resolve this concern. Three institutions also provide an insufficient basis for broad bank-level inference.

Finally, the construction combines conceptually distinct facets, and several items were adapted from measures developed for other purposes. The retained indicators show statistical consistency, but this does not by itself establish job-specific content validity or the adequacy of a single reflective construct. The original questionnaire, adaptation record, and dimension mapping are needed to assess content coverage and defensible alternative measurement structures. The choice between reflective and formative measurement requires conceptual justification concerning how indicators relate to a construct (Jarvis et al., 2003).

Future studies could examine infrastructure, efficiency, delivery methods, and competency dimensions separately to clarify their distinct relationships. Broader probability-based sampling would strengthen the basis for generalization beyond the three selected banks. Bank-level comparisons would require sufficient observations within each institution and appropriate assessment of measurement equivalence.

Longitudinal designs, multiple data sources, and objective outcomes would strengthen temporal inference. Future studies could evaluate out-of-sample prediction separately from explanation and examine when digital training contributes to capability and organizational outcomes.

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Conflicts of Interest

The authors declare no conflict of interest.

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Appendix 1: Principal component diagnostic

An unrotated principal component analysis of the correlation matrix used the 26 retained indicators and 375 cases contained in the submitted PLS export. The table reports eigenvalues, percentages of total standardized variance, and cumulative percentages. This diagnostic describes the final item set and does not establish the absence of common method bias.

Table A1 Variance explained by principal components

Component	Eigenvalue	Variance (%)	Cumulative (%)
1	10.953	42.13	42.13
2	3.607	13.87	56.00
3	2.953	11.36	67.36
4	0.585	2.25	69.61
5	0.574	2.21	71.81
6	0.528	2.03	73.85
7	0.501	1.93	75.77
8	0.490	1.88	77.66
9	0.462	1.78	79.43
10	0.457	1.76	81.19
11	0.428	1.65	82.84
12	0.404	1.56	84.39
13	0.391	1.50	85.90
14	0.383	1.47	87.37
15	0.358	1.38	88.75
16	0.335	1.29	90.04
17	0.329	1.27	91.31
18	0.311	1.20	92.50
19	0.309	1.19	93.69
20	0.283	1.09	94.78
21	0.267	1.03	95.81
22	0.248	0.95	96.76
23	0.236	0.91	97.67
24	0.220	0.85	98.51
25	0.209	0.80	99.32
26	0.178	0.68	100.00