



## **EVALUATION OF TECHNOLOGY INTEGRATION IN ELEMENTARY SCHOOL LEARNING USING THE TPACK FRAMEWORK AND THE CIPP MODEL**

**Ansori<sup>1</sup>, Bagus Nur Cahyono<sup>2</sup>**

<sup>1</sup> At-Taqwa University, East Java Indonesia, <sup>2</sup> Universitas Islam Malang, East Java Indonesia

Email : chansori99@gmail.com<sup>1</sup>, bagusnurcahyono@unisma.ac.id<sup>2</sup>

---

DOI:

Received: 17 Mei 2026

Accepted: 14 Juni 2026

Published: 30 Juni 2026

---

**Abstract :** This study aims to evaluate the effectiveness of technology integration in elementary school learning using the framework of Technological Pedagogical Content Knowledge (TPACK) and Model Context, Input, Process, Product (CIPP). The research uses a mixed methods approach with a convergent parallel design. The research locations include three Islamic elementary schools in Bondowoso Regency, namely At-Taqwa Islamic Elementary School Bondowoso, Manbaul Ulum Sulek Islamic Elementary School, Tlogosari District, and State Islamic Elementary School 1 Bondowoso. Data were collected through observations, interviews, TPACK-based questionnaires, and documentation studies. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed with the interactive model Miles, Huberman, and Saldaña, then integrated to obtain a comprehensive picture. The results showed that the competence of teachers based on the TPACK framework was in the good category with an average achievement of 84.2%, while the evaluation of technology implementation based on the CIPP Model obtained an average of 84.6% with the good category. The Pedagogical Content Knowledge (PCK) component obtained the highest achievements, while Technological Knowledge (TK) is still an aspect that needs strengthening. The CIPP evaluation shows that the Product aspect has the highest achievement, while the Input aspect still needs improvement, especially in the digital competence of teachers and the availability of supporting facilities. Technology integration is also followed by an increase in students' learning completeness from 69.8% to 88.4%. This study concludes that the integration of the TPACK framework and the CIPP Model is a comprehensive evaluation approach to assess teacher competence, the effectiveness of program implementation, and its impact on improving the quality of learning in elementary schools.

**Keywords :** *Technology Integration, TPACK, CIPP Model, Educational Evaluation, Elementary School Learning.*

**Abstrak :** Penelitian ini bertujuan mengevaluasi efektivitas integrasi teknologi dalam pembelajaran sekolah dasar menggunakan kerangka Technological Pedagogical Content Knowledge (TPACK) dan Model Context, Input, Process, Product (CIPP). Penelitian menggunakan pendekatan mixed methods dengan desain convergent parallel. Lokasi penelitian meliputi tiga sekolah dasar Islam di Kabupaten Bondowoso, yaitu Madrasah Ibtidaiyah At-Taqwa Bondowoso, SD Islam Manbaul

Ulum Sulek Kecamatan Tlogosari, dan MI Negeri 1 Bondowoso. Data dikumpulkan melalui observasi, wawancara, angket berbasis TPACK, dan studi dokumentasi. Data kuantitatif dianalisis menggunakan statistik deskriptif, sedangkan data kualitatif dianalisis dengan model interaktif Miles, Huberman, dan Saldaña, kemudian diintegrasikan untuk memperoleh gambaran yang komprehensif. Hasil penelitian menunjukkan bahwa kompetensi guru berdasarkan kerangka TPACK berada pada kategori baik dengan rata-rata capaian 84,2%, sedangkan evaluasi implementasi teknologi berdasarkan Model CIPP memperoleh rata-rata 84,6% dengan kategori baik. Komponen Pedagogical Content Knowledge (PCK) memperoleh capaian tertinggi, sedangkan Technological Knowledge (TK) masih menjadi aspek yang memerlukan penguatan. Evaluasi CIPP menunjukkan bahwa aspek Product memiliki capaian tertinggi, sementara aspek Input masih memerlukan peningkatan, terutama pada kompetensi digital guru dan ketersediaan sarana pendukung. Integrasi teknologi juga diikuti oleh peningkatan ketuntasan belajar peserta didik dari 69,8% menjadi 88,4%. Penelitian ini menyimpulkan bahwa integrasi kerangka TPACK dan Model CIPP merupakan pendekatan evaluasi yang komprehensif untuk menilai kompetensi guru, efektivitas implementasi program, dan dampaknya terhadap peningkatan kualitas pembelajaran di sekolah dasar.

**Kata Kunci:** *Integrasi Teknologi, TPACK, Model CIPP, Evaluasi Pendidikan, Pembelajaran Sekolah Dasar.*

## INTRODUCTION

Digital transformation in the world of education has encouraged schools to integrate technology into the learning process as an effort to improve the quality of learning and competence of 21st century students. Technology integration is no longer seen as a complement to learning, but is an essential part of creating an innovative, collaborative, and student-centered learning environment. At the elementary school level, the use of various digital platforms, interactive learning media, and artificial intelligence-based applications (Artificial Intelligence) has begun to be implemented to support the achievement of optimal learning outcomes. However, the success of technology integration is not only determined by the availability of digital devices, but also by teachers' competence in managing technology-based learning and the effectiveness of its implementation in the school environment (Mishra & Koehler, 2006; UNESCO, 2023).

The Technological Pedagogical Content Knowledge (TPACK) framework explains that teachers' competence in integrating technology must be built through a combination of mastery of the material (content knowledge), learning strategies (pedagogical knowledge), and the ability to utilize technology (technological knowledge). Teachers who have good TPACK competencies are able to choose technology that suits the characteristics of the material and the needs of students so that the learning process becomes more meaningful (Mishra & Koehler, 2006). On the other hand, evaluation of the implementation of technology-based learning requires a comprehensive approach to not only measure learning outcomes, but also consider the context, resources, implementation process, and results obtained. Therefore, the Context, Input, Process, Product (CIPP) Model developed by Stufflebeam is one of the evaluation models that are widely used to evaluate the effectiveness of an

educational program as a whole (Stufflebeam & Zhang, 2017).

Various previous studies have shown that teachers' TPACK competencies have a positive effect on the quality of digital learning and student learning outcomes. Research by Valtonen et al. (2017) found that improving teachers' TPACK competencies contributes to the success of technology integration in the classroom. Similarly, Schmid et al. (2021) through meta-analysis concluded that the use of digital technology supported by teachers' pedagogic competence has a positive impact on student engagement and learning achievement. Meanwhile, research using the CIPP Model shows that the evaluation of educational programs becomes more comprehensive because it is able to identify the strengths and weaknesses of the program from the aspects of context, input, process, and results (Stufflebeam & Zhang, 2017). Nonetheless, most studies still use TPACK to measure teacher competence or use CIPP separately to evaluate learning programs.

This condition shows that there is a research gap. To date, there is still relatively little research that integrates the TPACK framework with the CIPP Model as a comprehensive evaluation approach in assessing the success of technology integration in elementary school learning. In fact, the combination of these two approaches allows evaluation to be carried out not only on teachers' competence in integrating technology, but also on school readiness, implementation processes, infrastructure support, and its impact on learning quality. Thus, this study offers a more holistic evaluation perspective than previous studies.

Based on this description, the formulation of the problem in this study is: how effective is the integration of technology in elementary school learning based on evaluation using the TPACK framework and the CIPP Model? The purpose of this study is to evaluate the effectiveness of technology integration in elementary school learning through teacher competency analysis based on the TPACK framework as well as evaluation of context, inputs, processes, and results using the CIPP Model so that strategic recommendations to improve the quality of technology-based learning in elementary schools are obtained.

This research has a state of the art in the form of developing an evaluation model that integrates the TPACK framework and the CIPP Model in one analysis framework so that it is able to provide a more comprehensive picture of the success of technology implementation in elementary school learning. The originality of the research lies in the integrated use of the two frameworks to evaluate aspects of teacher competence, school readiness, implementation process, and learning outcomes in one systematic evaluation model. This approach is expected to enrich the study of educational evaluation as well as the basis for the formulation of policies to improve the quality of technology-based learning in elementary schools.

## RESEARCH METHOD

This study uses a mixed methods approach with a convergent parallel design, which is an approach that integrates quantitative and qualitative data in parallel to obtain a comprehensive understanding of the effectiveness of

technology integration in elementary school learning. This approach was chosen because the evaluation of educational programs not only requires measuring the achievement of indicators quantitatively, but also requires an in-depth explanation of the implementation process, supporting factors, and obstacles faced during program implementation (Creswell & Plano Clark, 2018). In this study, the Technological Pedagogical Content Knowledge (TPACK) framework was used to evaluate teachers' competencies in integrating technology, pedagogy, and learning materials, while the Context, Input, Process, Product (CIPP) Model was used as a comprehensive evaluation framework for the implementation of technology integration in learning.

This type of research is evaluation research using the CIPP (Context, Input, Process, Product) Model developed by Stufflebeam. This model was chosen because it is able to provide systematic information about program needs (context), resource readiness (input), quality of program implementation (process), and program implementation results (product). Evaluation is carried out formatively and summatively so as to produce recommendations that can be used as a basis for decision-making in improving the quality of technology-based learning in elementary schools.

The object of the research is the implementation of technology integration in learning in three Islamic Elementary Schools in Bondowoso Regency, namely At-Taqwa Islamic Elementary School Bondowoso, Manbaul Ulum Islamic Elementary School Sulek Village, Tlogosari District Bondowoso, and State Islamic Elementary School 1 Bondowoso. The three schools were selected using purposive sampling techniques with the consideration that each school has utilized digital technology in the learning process, has different institutional characteristics, and represents a variety of Islamic basic education in Bondowoso Regency. The research subjects include school principals, classroom teachers, subject teachers, school operators, and students involved in the implementation of technology-based learning.

The data collection technique is carried out through several methods in order to obtain valid and complementary data (triangulation method). First, observation is used to obtain data on the implementation of technology-based learning in the classroom using observation sheets compiled based on TPACK indicators and CIPP evaluation components. Second, semi-structured interviews were conducted with school principals and teachers to explore information about school policies, resource readiness, technology implementation strategies, and various obstacles faced during the implementation of digital learning. Third, a questionnaire was given to teachers to measure the level of TPACK competence using a five-level Likert scale instrument that had been adapted from the TPACK instrument developed by Schmidt et al. Fourth, a documentation study was carried out on learning planning documents, teaching modules, assessment tools, activity reports, school policies, and various supporting documents related to the implementation of technology in learning.

Quantitative data analysis was carried out using descriptive statistics, including mean values, percentages, standard deviations, and achievement

categories of each TPACK indicator and CIPP component. The results of the quantitative analysis are then interpreted based on the category of the level of effectiveness of program implementation. Meanwhile, qualitative data were analyzed using the interactive model Miles, Huberman, and Saldaña, which included the process of data condensation, data presentation, and conclusion drawing and verification. Furthermore, the results of quantitative and qualitative analysis are integrated (data integration) at the interpretation stage to obtain a complete picture of the effectiveness of technology integration in elementary school learning based on the perspective of teacher competence (TPACK) and program evaluation (CIPP). The validity of the data is maintained through source triangulation techniques, method triangulation, member checking, and peer debriefing so that the research results have a high level of credibility, dependability, and confirmability.

## FINDINGS AND DISCUSSION

### Findings

The results of the evaluation of technology integration in elementary school learning were analyzed using the Technological Pedagogical Content Knowledge (TPACK) framework and the Context, Input, Process, Product (CIPP) Model. The analysis was carried out qualitatively through learning observations, semi-structured interviews with principals and teachers, as well as documentation studies of learning tools and supporting documents for technology implementation. The data from the three techniques were then triangulated to obtain a comprehensive picture of the implementation of technology-based learning in the schools where the research was located.

In terms of **context**, the results of the analysis show that the three schools are committed to integrating technology into learning as part of efforts to improve the quality of education and adapt the learning process to the demands of 21st century competencies. School planning documents show that the use of digital media has been incorporated into the annual work program and is supported by the principal's policy of encouraging teachers to utilize technological devices in the learning process. However, the level of policy implementation is still influenced by the readiness of human resources, the school's digital culture, and the characteristics of students.

In the input aspect, the results of observation and documentation show that schools have provided various supporting facilities, such as internet networks, projectors, computers, and digital learning devices that can be used by teachers. From TPACK's perspective, teachers in general have shown mastery of learning materials and good learning strategies. However, the ability to choose and integrate technology that is in accordance with learning objectives still varies between teachers. Some teachers have been able to utilize digital learning platforms, interactive media, and learning evaluation applications, while others are still using technology at the stage of presenting material and have not optimized it to encourage collaborative and problem-solving-based learning.

In the process aspect, the observation results show that technology integration has become part of learning activities in the classroom, although the

intensity and quality of implementation vary. Teachers who have higher TPACK competencies tend to be able to integrate materials, learning strategies, and technology in harmony so that students are more actively participating in the learning process. On the other hand, in some learning activities, technology still functions as a presentation medium so that learning interactions have not fully utilized the potential of digital technology to increase student engagement.

In the product aspect, the results of the evaluation showed that the use of technology had a positive impact on the learning atmosphere, student motivation, and the effectiveness of material delivery. The teacher also said that the use of digital media helps explain abstract concepts and increase student participation during the learning process. However, the evaluation also identified several factors that still need strengthening, including improving teachers' digital competence through continuous training, providing more equitable tools, and developing a more systematic technology-based learning evaluation system.

Overall, the results of the qualitative evaluation show that the integration of technology in learning has developed in a positive direction and has received support from school policies and teacher readiness. However, the effectiveness of implementation is still influenced by the variety of teachers' TPACK competencies, the availability of supporting facilities, and the consistency of the implementation of technology based learning. These findings indicate that strengthening teacher competence and optimizing institutional support is an important factor in improving the quality of technology integration in elementary school learning.

A quantitative evaluation was carried out on the implementation of learning technology in three Islamic elementary schools in Bondowoso Regency, namely Islamic Elementary Schools At-Taqwa Bondowoso, Islamic Elementary Schools Manbaul Ulum Sulek, Tlogosari District, and State Islamic Elementary School 1 Bondowoso. The analysis focused on two main aspects, namely teacher competence based on the Technological Pedagogical Content Knowledge (TPACK) framework and the effectiveness of program implementation using the Context, Input, Process, Product (CIPP) Model. The statistical analysis used is descriptive statistics in the form of mean (Mean), percentage of achievement, standard deviation, and assessment category.

**Table 1. Average Teacher Competency Based on the TPACK Framework**

TPACK Components	Mean	Persentase (%)	Category
Content Knowledge (CK)	4.46	89.2	Excellent
Pedagogical Knowledge (PK)	4.38	87.6	Excellent
Technological Knowledge (TK)	3.81	76.2	Good
Pedagogical Content Knowledge (PCK)	4.51	90.2	Excellent
Technological Content Knowledge (TCK)	4.05	81.0	Good
Technological Pedagogical Knowledge (TPK)	4.10	82.0	Good
Technological Pedagogical Content Knowledge (TPACK)	4.18	83.6	Good
<b>Overall Average</b>	<b>4.21</b>	<b>84.2</b>	<b>Good</b>

Based on Table 1, it can be seen that teacher competence is in the **good**

category with an overall average of 84.2%. The Pedagogical Content Knowledge component (90.2%) obtained the highest score, indicating that teachers have excellent ability to integrate learning materials with pedagogic strategies. In contrast, Technological Knowledge (76.2%) was the component with the lowest score, indicating that digital technology mastery still needs to be strengthened through continuous training programs.

**Table 2. Results of Technology Implementation Evaluation Based on CIPP Model**

CIPP Components	Mean	Persentase (%)	Category
Context	4.30	86.0	Excellent
Input	4.08	81.6	Good
Process	4.19	83.8	Good
Product	4.35	87.0	Excellent
<b>Average</b>	<b>4.23</b>	<b>84.6</b>	<b>Good</b>

The results of the evaluation showed that the implementation of learning technology obtained an average score of 84.6% in the good category. The Product aspect obtained the highest score (87.0%), indicating that the use of technology has a positive impact on learning effectiveness and student engagement. Meanwhile, the Input aspect received the lowest score (81.6%), which indicates that the availability of technology devices, internet networks, and teachers' digital competencies still needs to be improved.

**Table 3. Comparison of TPACK and CIPP Scores in Three Schools**

School	TPACK Score (%)	Score CIPP (%)	Category
At-Taqwa Bondowoso Islamic Elementary School	87.8	88.2	Excellent
Manbaul Ulum Sulek Islamic Policy School	81.5	82.7	Good
State Islamic Elementary School 1 Bondowoso	83.4	82.9	Good
<b>Average</b>	<b>84.2</b>	<b>84.6</b>	<b>Good</b>

Based on Table 3, Islamic Elementary Schools At-Taqwa Bondowoso obtained the highest score in both the TPACK and CIPP aspects. This indicates that technology integration has been supported by teacher competence and school management which is relatively better than the other two schools. Nevertheless, all three schools showed a minimum good category, so it can be said that the implementation of learning technology has been running effectively.

**Table 4. Changes in Student Learning Completeness**

Stages	Completion Percentage (%)	Category
Before Technology Integration	69.8	Enough
Semester I	80.6	Good
Semester II	88.4	Excellent

The results of the analysis showed that there was a tendency to increase the completeness of students' learning after technology integration was applied in the learning process. The completion percentage increased from 69.8% before implementation to 88.4% at the end of the second semester. These findings show that technology-based learning contributes to increasing the effectiveness of the teaching and learning process.

**Table 5. Summary of Evaluation Results**

Variabel	Percentage (%)	Category
TPACK Teacher Competency	84.2	Good
Context Evaluation	86.0	Excellent
Evaluation of Inputs	81.6	Good
Process Evaluation	83.8	Good
Product Evaluation	87.0	Excellent
Student Learning Completeness	88.4	Excellent

Overall, the results of the quantitative analysis indicate that the integration of technology in elementary school learning is in the good category with an average achievement of more than 84%. The pedagogic dimension of teachers shows higher achievement than the technological dimension, while evaluation using the CIPP Model shows that the product aspect is the most optimal component. However, the input aspect still needs attention, especially in improving teachers' digital competence, equitable distribution of technology facilities, and strengthening digital learning infrastructure support.

The results of the study show that the integration of technology in learning at At-Taqwa Bondowoso Islamic Elementary School, Manbaul Ulum Sulek Islamic Elementary School, Tlogosari District, and State Islamic Elementary School 1 Bondowoso has been carried out in a good category, although the level of implementation still varies from school to school. Qualitatively, the results of observations, interviews, and documentation studies indicate that the three schools have a strong commitment to developing technology-based learning through school policy support, the provision of digital facilities, and the use of various interactive learning media. Teachers in general have been able to integrate mastery of materials, learning strategies, and technology in the learning process, although digital technology competencies still need to be strengthened through continuous training. From the perspective of the CIPP Model evaluation, the implementation of the program has shown the suitability between school needs, resource readiness, implementation processes, and learning outcomes, although several obstacles are still found, such as the limitations of digital infrastructure, variations in teachers' abilities in utilizing learning applications, and the lack of optimal use of technology to support authentic assessments. The qualitative findings were strengthened by the results of quantitative analysis which showed that the average teacher competence based on the TPACK framework reached 84.2% with the good category, where the Pedagogical Content Knowledge (PCK) component obtained the highest achievement of 90.2%, while Technological Knowledge (TK) obtained the lowest achievement of 76.2%. Meanwhile, the results of the evaluation using the CIPP Model obtained an average of 84.6% with a good category, consisting of Context aspects of 86.0%, Input of 81.6%, Process of 83.8%, and Product of 87.0%, which shows that the impact of technology implementation on learning processes and outcomes has been running effectively. Comparisons between schools show that Islamic Elementary Schools At-Taqwa Bondowoso obtained the highest achievement compared to the other two schools, even though all schools were in the minimum good category. In addition, technology integration is also followed

by an increase in student learning completeness from 69.8% before implementation to 88.4% after technology-based learning is implemented. Overall, the results of the study indicate that the success of technology integration in elementary school learning is influenced by the synergy between teachers' TPACK competencies, institutional support, readiness of infrastructure, quality of program implementation based on the CIPP Model, and the school's commitment to building a sustainable digital learning culture.

## Discussion

The results of the study show that the integration of technology in learning in three Islamic elementary schools in Bondowoso Regency is generally in the good category, both from the perspective of teacher competence based on the Technological Pedagogical Content Knowledge (TPACK) framework and the effectiveness of program implementation based on the Context, Input, Process, Product (CIPP) Model. These findings indicate that the success of technology integration in learning is not only determined by the availability of technological devices, but also influenced by teachers' ability to integrate material knowledge, pedagogy, and technology simultaneously as well as the school system's support for the implementation of digital learning.

Based on the TPACK framework developed by Mishra and Koehler (2006), teacher competence is the result of integration between Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). The three components do not stand alone, but interact with each other in shaping the teacher's ability to design an effective learning experience. The results of the study show that the dimension of Pedagogical Content Knowledge (PCK) obtained the highest achievement, while Technological Knowledge (TK) is still the dimension with relatively lower achievements. This condition shows that teachers have good mastery of the material and learning strategies, but mastery of digital technology still needs strengthening. These findings reinforce the view of Mishra and Koehler (2006) that the success of technology-based learning is not enough to only master technology, but must be able to integrate technology with appropriate pedagogical approaches and characteristics of the material taught. Thus, improving teachers' digital competence through TPACK integration-oriented training is a strategic need in the professional development of elementary school teachers.

The results of the study also show that the dimension of Technological Pedagogical Content Knowledge (TPACK) is in the good category. This indicates that most teachers have been able to choose digital media that is relevant to learning goals, utilize interactive learning applications, and integrate technology to increase student engagement. The findings are in line with the theory of constructivism put forward by Lev Vygotsky, who emphasizes that the learning process will be more meaningful when students have the opportunity to build their knowledge through interaction with the environment, teachers, and various learning resources. In the context of digital learning, technology functions as a *mediating tool* that expands the space for interaction, collaboration, exploration, and knowledge construction. Therefore,

technology is not only a presentation tool, but also a means that facilitates active, collaborative, and *student-centered learning*.

Viewed from the perspective of the CIPP Model developed by Daniel L. Stufflebeam, the results show that all components of evaluation Context, Input, Process, and Product are in the good to very good category. In the context aspect, school policies that support the digitalization of learning show that there is a compatibility between school needs and the goal of technology implementation. According to Stufflebeam, context evaluation aims to identify the needs, problems, and opportunities that are the basis for the preparation of a program. Therefore, the existence of school policies that support technology-based learning is an indicator that the program has been designed based on the needs of educational organizations.

In the input aspect, the research shows that technological facilities, internet networks, and teacher competencies have been available at an adequate level, although there are still variations in quality between schools. In CIPP evaluation theory, input evaluation not only assesses the availability of resources, but also measures the readiness of the organization in implementing a program. Thus, the findings of the study indicate that the success of technology integration is still influenced by the equitable distribution of digital facilities, stable internet access, and the sustainability of teacher competency development programs. This condition shows that investment in digital infrastructure needs to be balanced with investment in increasing the capacity of human resources so that technology implementation can take place optimally.

In the process aspect, the observation results show that technology-based learning has been implemented systematically, although the intensity of technology use still varies among teachers. From the perspective of CIPP evaluation, process evaluation aims to monitor the suitability of program implementation with the plan that has been prepared as well as identify various obstacles during implementation. The findings of the study show that teachers who have higher TPACK competencies tend to be able to create more interactive, adaptive, and collaborative learning than teachers who only use technology as a presentation medium. This shows that the quality of technology implementation is greatly influenced by the teacher's ability to integrate the technology dimension with appropriate learning strategies.

Meanwhile, the product aspect obtained the highest achievement compared to other CIPP components. Increasing student learning completeness and increasing student involvement during the learning process show that technology integration makes a positive contribution to learning quality. This finding can be explained through the Technology Acceptance Model (TAM) theory developed by Fred D. Davis. According to TAM, the acceptance of technology is influenced by two main factors, namely *perceived usefulness* and *perceived ease of use*. When teachers and students view technology as a useful and easy-to-use tool, the level of acceptance of technology will increase and have an impact on learning effectiveness. In this study, the high achievement in the product aspect shows that technology has been accepted as part of the

learning process so that it can increase student motivation, participation, and learning outcomes.

The findings of this study also show a complementary relationship between the TPACK framework and the CIPP Model. The TPACK framework provides information on the quality of teachers' professional competencies in integrating technology, while the CIPP Model explains the effectiveness of program implementation as a whole, starting from the context to the results achieved. The integration of the two approaches results in a more comprehensive evaluation than using either approach separately. Thus, this study offers a new perspective in the evaluation of technology-based learning, which is not only assessing the individual competence of teachers, but also evaluating organizational readiness, the quality of program implementation, and its impact on student learning outcomes.

Conceptually, the results of this study strengthen the TPACK paradigm as a framework for 21st century teacher competency development while confirming the relevance of the CIPP Model as a comprehensive model for evaluating educational programs. The integration of these two approaches is a scientific contribution to this research because it is able to produce a more holistic evaluation model in examining the implementation of technology in elementary school learning. From a practical perspective, the findings of the study imply that improving the quality of technology-based learning is not enough to be done through the provision of digital devices alone, but must be followed by strengthening the competence of TPACK teachers, developing school digital culture, providing adequate infrastructure, and evaluating programs on an ongoing basis using the CIPP Model as a basis for decision-making to improve the quality of education.

## CONCLUSION

This study concludes that the integration of technology in learning in three Islamic elementary schools in Bondowoso Regency, namely At-Taqwa Islamic Elementary School Bondowoso, Manbaul Ulum Sulek Islamic Elementary School, Tlogosari District, and State Islamic Elementary School 1 Bondowoso, based on the framework of Technological Pedagogical Content Knowledge (TPACK) and Model Context, Input, Process, Product (CIPP) in general, is in the good category. From TPACK's perspective, teachers have shown a good ability to integrate material knowledge, pedagogy, and technology in the learning process, although the Technological Knowledge (TK) aspect is still a component that needs to be strengthened through the development of sustainable digital competencies. Meanwhile, the evaluation using the CIPP Model shows that the implementation of technology has been supported by school policies, the availability of resources, a relatively effective learning process, and has a positive impact on improving the quality of learning and learning outcomes of students. The findings of this study also show that the success of technology integration is not only determined by the availability of digital infrastructure, but is greatly influenced by teacher competence, school leadership, organizational culture, and program evaluation carried out

systematically and continuously.

The main contribution of this research lies in the integration of the TPACK framework and the CIPP Model in one comprehensive evaluation model, so as to provide a more complete picture of teacher readiness, the quality of program implementation, and the impact of technology integration on learning in elementary schools. This approach extends the study of educational evaluation by not only assessing individual teacher competencies, but also linking them to the institutional context, resources, implementation process, and results achieved. Therefore, further research is recommended to test this evaluation model on a wider area scope, involving more educational units with diverse characteristics, and combining inferential statistical analysis, such as *Structural Equation Modeling (SEM)* or *multilevel analysis*, in order to gain a deeper understanding of the relationship between TPACK competencies, the effectiveness of program implementation based on the CIPP Model, and the improvement of student learning outcomes.

## REFERENCES

- Anggraini, F. L. (2025). EKSPLOKASI PRAKTIK BLENDED SOCIO-DIGITAL LEARNING DALAM MEMBANGUN AGENCY BELAJAR PADA SISWA. *Al-ATHFAL: Jurnal Pendidikan Anak*, 6(4), 578-593. <https://doi.org/10.46773/alathfal.v6i4.2499>
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). SAGE Publications.
- Davis, F. D. (1989). *Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology*. <https://doi.org/10.2307/249008>
- Mishra, P., & Koehler, M. J. (2006). *Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge*. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017-1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Sapto Irawan, & Danu Prasetyo. (2020). The evaluation of online school examination implementation using CIPP model. *Jurnal Penelitian dan Evaluasi Pendidikan*, 24(2). <https://doi.org/10.21831/pep.v24i2.33032>
- Schmid, R., Brianza, E., & Petko, D. (2021). Developing a short assessment instrument for Technological Pedagogical Content Knowledge (TPACK.xs) and comparing the factor structure of an integrative and a transformative model. *Computers & Education*, 157, 103967. <https://doi.org/10.1016/j.compedu.2020.103967>

- Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers. *Journal of Research on Technology in Education*, 42(2), 123–149. <https://doi.org/10.1080/15391523.2009.10782544>
- Stufflebeam, D. L. (2003). The CIPP Model for Evaluation. Dalam *International Handbook of Educational Evaluation*. [https://doi.org/10.1007/978-94-010-0309-4\\_4](https://doi.org/10.1007/978-94-010-0309-4_4)
- Stufflebeam, D. L., & Zhang, G. (2017). *The CIPP Evaluation Model: How to Evaluate for Improvement and Accountability*. Guilford Press.
- Stufflebeam, D. L., & Zhang, G. (2017). *The CIPP Evaluation Model: How to Evaluate for Improvement and Accountability*. Guilford Press.
- UNESCO. (2023). *Global Education Monitoring Report 2023: Technology in Education – A Tool on Whose Terms?* UNESCO Publishing.
- Valtonen, T., Sointu, E., Kukkonen, J., Kontkanen, S., Lambert, M. C., & Mäkitalo-Siegl, K. (2017). TPACK updated to measure pre-service teachers' twenty-first century skills. *Australasian Journal of Educational Technology*, 33(3), 15–31. <https://doi.org/10.14742/ajet.3518>
- Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.
- Zhang, G., Zeller, N., Griffith, R., Metcalf, D., Williams, J., Shea, C., & Misulis, K. (2011). Using the Context, Input, Process, and Product Evaluation Model (CIPP) as a Comprehensive Framework to Guide the Planning, Implementation, and Assessment of Service-Learning Programs. *Journal of Higher Education Outreach and Engagement*, 15(4), 57–84.