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Linking Educational Technology Competence to the Supervisory Performance of Master Teachers in Basic Education

Jezrill N. Balmores [1], Ernie C. Cerado, PhD [1]
1 − Sultan Kudarat State University

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Abstract

This study looked into SOCCSKSARGEN Master Teachers' educational technology competence and how it affected their ability to supervise. Its main focuses were research, professional development, supervision, mentoring, and instruction. The study employed a descriptive-correlational approach and included interviews in addition to surveys of 1,630 teachers and 326 master teachers from 72 schools. Teachers' evaluation ratings, IPCR ratings, and questionnaires were used to gather data. The association between performance and competence was examined using statistical methods such as Pearson's r and t-test. The results show how technology competence improves supervision and leadership, emphasizing the necessity of ongoing professional development for Master Teachers in educational technology. The results indicated that Master Teachers had a combined "Good" level of technology expertise, superior teaching capacity, and professional growth. Their research capability was, however, assessed at "Fair", which points to the enhancement of the infusion of technology into research practices. As far as supervisory performance goes, Master Teachers earned an "Outstanding" rating for IPCR assessment, while teacher ratings lagged a step behind at "Very Satisfactory". This is an indication of difference in performance rating by teachers and IPCR rating. There was a strong positive correlation between supervisory performance and educational technology proficiency ($p < 0.05$), especially in such activities as curriculum design and instructional assistance. Use of technology to research, however, was not found to have an impact on supervisory effectiveness. Master Teachers saw their technological ability as critical to improving instruction, mentoring, and management of resources, but saw obstacles such as limited access to technology and resistance to technological innovation. In conclusion, while Master Teachers from the region are very technologically proficient, research-oriented training and more balanced appraisal systems are proposed. These can be filled to improve their overall performance as supervisors and leaders.

Keywords: Educational Technology Competence, Master Teachers, Supervisory Performance, Basic Education

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Introduction

The application of educational technology has become a pillar of 21st-century education, transforming pedagogy, learning, and supervision systems across the world. Advances in technology have facilitated teachers to employ new pedagogical practices, develop cooperative learning, and differentiate teaching to meet the varied needs of students. Global efforts like UNESCO's Sustainable Development Goal 4 highlight the potential of technology to achieve inclusive and equitable quality education. Master teachers, as education leaders, play a central role in this transformation, with their capacity for educational technology influencing teaching ability and supervisory practice (UNESCO, 2021).

At the global level, governments and institutions have made significant investment in strengthening the technological proficiency of teachers. Singapore and Finland led the charge with teacher professional development in digital literacy and instruction leadership. Singapore's Masterplan for ICT in Education, for example, prepares teachers to integrate technology into pedagogy and mentorship (Lim et al., 2020). Similarly, in the USA, the National Education Technology Plan emphasizes leadership as the means of expanding technology utilization in schools (U.S. Department of Education, 2020). Despite these efforts, disparities persist in the ability of educators—especially master teachers in supervisory roles—to leverage technology effectively, often due to varying levels of access, training, and institutional support.

DepEd in the Philippines has understood the importance of education technology in fulfilling its mandate of delivering quality basic education. Initiatives like the Digital Rise Program and the DepEd Computerization Program focus on computerizing the education system by equipping schools with digital tools and improving teachers' technological competence (DepEd, 2021). Master teachers, whose roles are to lead and mentor colleagues, are meant to lead the process of incorporating educational technology. Yet, technology skills among teachers are shown in research to be deficient in some areas because of inadequate training, lack of resources, and differences in readiness (Cabrera & Santos, 2022). Such shortcomings dishearten master teachers from completely playing their overseer roles, especially in rural and low-income areas.

To further improve technology integration, DepEd released Memorandum No. 78, s. 2020, entitled "Guidelines on the Implementation of the DepEd Learning Management System (LMS) and DepEd Commons" and focuses on encouraging teachers to use digital platforms for teaching, monitoring, and staff development. This policy also highlights the expectation of master teachers to be technologically literate in educational technology to spearhead effective teaching practices and serve as a mentor to other teachers.

Locally, in the SOCCSKSARGEN province of South Cotabato, Cotabato, Sultan Kudarat, Sarangani, and General Santos City, the use of educational technology is not without its issues. Despite initiatives to advance the technology equipment in schools, issues of minimal infrastructure, disparate internet connectivity, and inadequate training opportunities continue to prevail. Model teachers in SOCCSKSARGEN who are instructional leaders and supervisors face these challenges on a daily basis, and they affect their use of technology in supervisory work. Despite the fact that it is their most important role to guide and mentor teachers, little is written about how their ed-tech capability affects their supervisory work in this regard.

Whereas previous research investigates the intersection of instructional performance and technology integration, little literature exists to examine the intersection between master teachers' supervisory performance and teaching technology skills. Although most literature addresses classroom teaching or school administration, no clear picture appears regarding how master teachers fulfill their dual role of supervision and teaching in technology-enriched educational settings. This gap is particularly acutely experienced in SOCCSKSARGEN, where infrastructural, cultural, and socio-economic contexts converge specially to shape the use and adoption of educational technology.

Addressing this knowledge gap is essential in planning intervention and professional development activities that will improve master teachers' supervisory performance by advancing their technology competency. This research seeks to close this gap by investigating the connection between educational technology proficiency and the supervisory performance of master teachers in basic education in the

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SOCCSKSARGEN region. The results will add to the growing body of literature in the field of education technology and be used to support practice and policy promoting instructional leadership and effective mentoring in primary teaching.

Statement of the Problem

Generally, the study assessed the educational technology competence of Master Teachers and their supervisory performance in SOCCSKSARGEN region.

Specifically, this provided answers to the following research questions:

1. What is the level of Master Teachers' educational technology competence based on the following dimensions:
1.1 Instruction;
1.2. Coaching and Mentoring;
1.3. Observation and Supervision;
1.4. Professional Development; and
1.5. Research?
2. What is the level of supervisory performance of the Master Teachers based on:
2.1 IPCR Rating; and
2.2 Teachers' Evaluation Rating?
3. Is there a significant relationship between master teachers' educational technology competence and their supervisory performance?
4. Is there a significant difference on the performance of the Master Teachers based on IPCR rating and the teachers' evaluation rating?

Methodology

The study employed a descriptive-correlational research design with survey questionnaires used as tools in collecting the necessary data. The present research determines and describe the Master Teachers' educational technology competence as well as their supervisory performance. This also evaluate the relationship between the educational technology competence and the supervisory performance of the master teachers.

Locale of the Study

The study was conducted in SOCCSKSARGEN Region. Also known as Region 12, the region is located in South Central Mindanao. It is made up of four provinces, namely: South Cotabato, Cotabato, Sultan Kudarat, and Sarangani, and the four cities of General Santos, Koronadal, Tacurong, and Kidapawan.

Respondents of the Study

There were two (2) groups of intended respondents in this study. The first group was composed of the Master Teachers of the randomly selected public elementary, junior, and senior high schools in Region 12. On the other hand, the second group consisted of the teachers who were under the supervision of these Master Teachers and who rated them on their supervisory performance.

The respondents of the study were three hundred twenty-six (326) Master Teachers and one thousand six hundred thirty (1,630) teachers of randomly selected public elementary, junior, and senior high schools in Region 12.

Statistical Treatment/Data Anlysis

The process of data collection involved the educational technology competence of master teachers, the IPCR rating, and teachers' evaluation rating for the performance of master teachers. The accomplished questionnaires were immediately encoded, tabulated and analyzed. The data were computed using the

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appropriate statistical tools with the help of Microsoft Excel and Statistical Package for the Social Sciences (SPSS) software.

In particular, the mean and standard deviation were used to describe the result of educational technology competence of master teachers, the IPCR rating, and teachers' evaluation rating. Pearson r (r^2) was utilized to find out the significant relationship of master teachers' educational technology competence and their supervisory performance. T-test was utilized to find out the significant difference on the performance of Master Teachers in IPCR rating and teachers' evaluation rating.

Results and Discussion

The first research problem deals with the level of master teachers' educational technology competence in basic education based on instruction, coaching and mentoring, observation and supervision, professional development, and research. The summary of findings is shown in Table 1.

Table 1. Summary on the Level of Master Teachers' Educational Technology Competence

Indicators	Means	SD	Interpretation
Instruction	3.44	1.06	Very Good
Coaching and Mentoring	3.30	1.10	Good
Observation and Supervision	3.29	1.03	Good
Professional Development	3.41	1.01	Very Good
Research	2.49	1.11	Fair
Overall Mean	**3.19**	**1.06**	**Good**

As shown, the summary of the level of Master Teachers' educational technology competence is Good (M=3.19, SD= 1.06). This result reflects a strong foundation in integrating educational technology across various roles but highlights the need for continuous improvement in certain areas, particularly in research. This indicates that while Master Teachers are competent in using educational technology, more targeted development or support in areas such as research and mentoring could help them fully leverage the potential of technology to improve their practices and impact on student learning outcomes.

This interpretation is supported by the meta-analysis found by Li & Ni (2020) which indicates that teachers who demonstrate a good level of competence in educational technology integration achieve positive student outcomes. The claim highlights that when master teachers use technology proficiently, student engagement increases, leading to improved academic performance. It stresses the importance of ongoing development to maintain and enhance this level of competence.

According to recent research, Master Teachers who are very proficient in integrating technology demonstrate greater levels of self-assurance, flexibility, and dedication to lifelong learning. According to research, educators who possess strong digital competences exhibit a proactive approach to professional development, self-efficacy in using digital resources, and receptivity to developing technology (Russell et al., 2023; Celik, 2022).

Furthermore, educators who actively incorporate technology into their professional growth and teaching methods are more likely to improve student engagement and hone their pedagogical approaches. Digital competence frameworks highlight how tech-savvy educators design creative learning spaces that encourage students' digital literacy and critical thinking (Jeon & Lee, 2023; Ali et al., 2023).

The significance of ongoing digital training and technology integration projects in teacher education programs is highlighted by these findings, which guarantee that Master Teachers continue to be leaders in digital pedagogy (Farrelly & Baker, 2023; Learning Policy Institute, 2023).

The second research problem deals with the supervisory performance of master teachers based on IPCR and teachers' evaluation ratings. The summary of findings is shown in tables 2-3.

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Table 2. Level of Supervisory Performance of Master Teachers based on IPCR Rating

Indicators	Mean Ratings	SD	Interpretation
Content Knowledge and Pedagogy	4.66	0.32	Outstanding
Learning Environment and Diversity of Learners	4.66	0.39	Outstanding
Curriculum and Planning	4.56	0.30	Outstanding
Assessment and Reporting	4.56	0.35	Outstanding
Personal Growth and Professional Development	4.75	0.27	Outstanding
Overall Mean	**4.63**	**0.33**	**Outstanding**

As presented, the level of supervisory performance of Master Teachers based on IPCR Rating is Outstanding (M=4.63, SD= 0.33). It suggests that Master Teachers consistently perform at a very high level in their supervisory roles. It also indicates that the teachers are highly effective in carrying out their supervisory duties, and their performance is considered exceptional.

This implies that Master Teachers not only meet but exceed expectations in their supervisory responsibilities. This strong performance is likely contributing to the enhancement of teaching quality, fostering a collaborative learning environment, and ensuring continuous professional growth within the educational setting.

Glickman et al. (2017) explain that outstanding supervisory performance is marked by teachers' ability to lead and mentor effectively. When Master Teachers receive high ratings in their supervisory roles, it reflects their capacity to not only provide leadership but also engage in professional development initiatives that promote best practices across the school. Master Teachers with such competencies are essential in creating an environment of continuous learning and instructional excellence.

Additionally, Leithwood et al. (2019) states that effective leadership in education, including the role of Master Teachers, is central to school improvement. Master Teachers who are rated as outstanding in their supervisory roles exhibit strong leadership qualities, foster a culture of collaboration, and provide necessary mentorship to enhance teaching practices. These actions contribute significantly to the overall success of the school system.

In conclusion, Master Teachers with outstanding supervisory performance make a significant positive impact on the professional development of their colleagues. Their ability to provide high-quality leadership, mentorship, and feedback directly influences the effectiveness of teaching and enhances student learning outcomes.

Table 3 shows the summary of supervisory performance of the master teachers based on teachers' evaluation rating.

Table 3. Level of Supervisory Performance of the Master Teachers based on Teachers' Evaluation Rating

Indicators	Mean Ratings	SD	Interpretation
Classroom Observation	3.92	0.62	Very Satisfactory
Model Assessment	3.87	0.70	Very Satisfactory
Test Bank Development	3.72	0.63	Very Satisfactory

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Feedback Provision	3.68	0.63	Very Satisfactory
Running a Meeting	3.78	0.63	Very Satisfactory
Learning Action Cell Sessions	3.72	0.64	Very Satisfactory
Overall Mean	**3.78**	**0.64**	**Very Satisfactory**

As demonstrated, the level of supervisory performance of the Master Teachers based on Teachers' Evaluation Rating is Very Satisfactory (M=3.78, SD= 0.64). This means that Master Teachers are performing well in their supervisory roles, with their performance considered above.

This implies that Master Teachers are performing competently and effectively in their supervisory roles, with a generally positive impact on their colleagues, ensuring even greater consistency and effectiveness in their leadership.

Hallinger and Heck (2017) argue that effective supervision significantly influences school effectiveness. The positive evaluation of Master Teachers' supervisory performance reflects their competence in leadership roles, which contributes to the professional growth of teachers. These supervisors help ensure that teaching practices remain effective, which leads to a positive impact on students' learning experiences.

Danielson's (2017) work stresses the importance of effective supervision and leadership in improving teacher quality. A "very satisfactory" rating on supervisory performance implies that Master Teachers are consistently demonstrating their effectiveness in leading their peers, providing valuable feedback, and fostering an environment where teachers feel supported and empowered to improve their practices.

This interpretation summarizes that Master Teachers are performing well in their supervisory roles, with a generally positive and above-average impact on their colleagues. They contribute to ensuring consistency and effectiveness in leadership, fostering professional growth, and enhancing instructional quality.

The third research problem deals with the correlational analysis between the master teachers' educational technology competence and their supervisory performance as reflected in Table 4-5.

Table 4. Results of Pearson-r Analysis between the Level of Master Teachers' Educational Technology Competence and their Supervisory Performance based on IPCR Rating

Indicators	Content Knowledge and Pedagogy	Learning Environment and Diversity of Learners	Curriculum and Planning	Assessment and Reporting	Personal Growth and Professional Development	Overall IPCR Rating
Instruction	.068 (.225)	.029 (.602)	.131* (.019)	-.010 (.862)	.116* (.039)	
Coaching and Monitoring	.093 (.100)	.058 (.307)	.150* (.008)	.018 (.747)	.118* (.035)	
Observation and Supervision	.071 (.205)	.061 (.276)	.143* (.011)	.049 (.383)	.141* (.012)	
Professional Development	.117* (.037)	.103 (.068)	.158* (.005)	-.039 (.490)	.071 (.209)	

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Research	.071 (.208)	.026 (.647)	.053 (.349)	-.067 (.232)	.066 (.240)	
Overall MTs Educational Technology Competence						.116* (.040)

**Significant at the .05 level*

Table 4 presents the results of the Pearson-r analysis, examining the relationship between Master Teachers' Educational Technology Competence and their Supervisory Performance, as measured by their IPCR Rating. The table reports correlation values for different supervisory performance indicators, including Instruction, Coaching and Monitoring, Observation and Supervision, Professional Development, and Research, across various domains of educational technology competence.

The analysis reveals that Master Teachers' educational technology competence and IPCR Rating is statistically significant with (r = .116, p=.040) at 0.05 level. Moreover, the analysis reveals that several correlations are statistically significant. Specifically, within the Curriculum and Planning domain, significant correlations were found with Instruction (r = .131, p = .019), Coaching and Monitoring (r = .150, p = .008), Observation and Supervision (r = .143, p = .011), and Professional Development (r = .158, p = .005). Similarly, in the Personal Growth and Professional Development domain, significant relationships were observed with Instruction (r = .116, p = .039), Coaching and Monitoring (r = .118, p = .035), and Observation and Supervision (r = .141, p = .012).

According to these results, Master Teachers who are more proficient in educational technology typically do better in supervisory positions, especially when it comes to professional development, curriculum planning, and instructional monitoring. This backs up the research of Bond et al. (2018), which discovered that integrating educational technology into the classroom greatly improves teachers' abilities to supervise and lead instruction. Furthermore, in order to properly supervise and assess instructors in a technology-driven learning environment, Hamilton et al. (2020) underlined the importance of digital competency for educators.

The findings also show that some associations, especially in the Research domain, were not significant, indicating that supervisory responsibilities connected to research may not be directly impacted by educational technological competency. This supports the findings of Koehler and Mishra (2017), who contended that although technological competence improves supervision and instruction, it does not always result in higher research output in the absence of focused professional development.

The findings underscore the need of augmenting Master Teachers' proficiency in educational technology in order to improve their supervisory abilities, namely in the areas of curriculum development, coaching, and instructional leadership. In order to further improve the supervisory efficacy of Master Teachers, educational institutions ought to give priority to ongoing training programs that emphasize technological integration.

Table 5. Results of Pearson-r Analysis between the Level of Master Teachers' Educational Technology Competence and their Supervisory Performance based on Teachers' Evaluation Rating

Indicators	Classroom Observation	Model Assessment	Test Bank Development	Feedback Provision	Running a Meeting	Learning Action Cell Sessions	Overall Teachers' Evaluation Rating
Instruction	.661* (.000)	.683* (.000)	.685* (.000)	.667* (.000)	.640* (.000)	.640* (.000)	
Coaching and Monitoring	.666* (.000)	.670* (.000)	.670* (.000)	.675* (.000)	.649* (.000)	.634* (.000)	

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Observation and Supervision	.664* (.000)	.709* (.000)	.710* (.000)	.697* (.000)	.668* (.000)	.641* (.000)	
Professional Development	.684* (.000)	.724* (.000)	.723* (.000)	.695* (.000)	.646* (.000)	.645* (.000)	
Research	.542* (.000)	.607* (.000)	.608* (.000)	.592* (.000)	.578* (.000)	.524* (.000)	
Overall MTs Educational Technology Competence							.769* (.000)

**Significant at the .05 level*

Table 5 presents the results of the Pearson-r analysis, examining the relationship between Master Teachers' educational technology competence and their supervisory performance, as evaluated through Teachers' Evaluation Ratings. The table provides correlation values between different supervisory performance indicators—Classroom Observation, Model Assessment, Test Bank Development, Feedback Provision, Running a Meeting, and Learning Action Cell (LAC) Sessions—and the level of educational technology competence among Master Teachers.

According to the analysis, there is a substantial positive association between Master Teachers' supervisory duties and their educational technology competency, with all correlation values being statistically significant at the 0.05 level (r = .769, p =.000). Overall Educational Technology Competence and Teachers' Evaluation Rating have the strongest correlation (r =.769, p =.000), indicating that as Master Teachers become more proficient in educational technology, their peers and subordinates will view their performance in supervisory roles more favorably.

Professional Development had the highest connection with both Test Bank Development (r =.723, p =.000) and Model Assessment (r =.724, p =.000) among the supervisory measures. This suggests that Master Teachers who use technology well are better at creating standardized tests and evaluating instructional models, which supports the findings of Koehler et al. (2016), who highlighted how technological competency improves teachers' capacity to create and evaluate instructional frameworks. In a similar vein, Bond et al. (2018) discovered that instructors who are proficient in technology are more likely to participate in worthwhile professional development activities, which enhances their supervisory roles.

Additionally, there was a substantial association between Test Bank Development (r =.709, p =.000) and Feedback Provision (r =.710, p =.000) and Observation and Supervision. According to Hamilton et al. (2020), who emphasized that digital tools improve real-time assessment, feedback, and instructional planning, this shows that educational technology supports efficient monitoring and feedback mechanisms in teacher supervision.

Despite the fact that all correlations were significant, the Research domain had comparatively lower correlation values than the other indicators; Test Bank Development had the strongest correlation, with r =.608 (p =.000). This implies that although proficiency with educational technology is essential for supervisory and teaching roles, its direct influence on research-related endeavors can be little unless it is complemented with research-specific training and resources. Although technology makes research easier, Mishra and Warr (2021) contended that its usefulness in this field depends on how well-versed instructors are in data analysis tools and research procedures.

The fourth research problem deals with the difference between the performance ratings of the master teachers based on IPCR rating and teachers' evaluation rating as reflected in Table 6.

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Table 6. Results of Paired t-test Analysis between the Performance ratings of the Master Teachers based on IPCR Rating and Teachers' Evaluation Rating

Indicators	n	Mean	SD	t	df	p (2-tailed)	Mean Difference
Master Teacher's IPCR Rating	326	4.63	0.33	24.234	324	.000	0.85
and Teachers' Evaluation Rating		3.78	0.64				

**Significant at 0.05 level*

Table 6 presents the results of the Paired t-test analysis comparing the performance ratings of Master Teachers based on their Individual Performance Commitment Review (IPCR) Rating and Teachers' Evaluation Rating. The mean difference between the two ratings is 0.85, with a t-value of 24.234 and a significant value (p-value) of 0.000.

The difference between the two ratings is statistically significant because the p-value is less than 0.05, indicating that the way Master Teachers are rated through Teachers' Evaluation Ratings and the IPCR rating system is different. This supports the findings of Kraft and Gilmour (2016), who contended that variations in assessment criteria, subjective assessments, and institutional standards frequently result in inconsistent outcomes from performance evaluation techniques.

The findings show that while the Teachers' Evaluation Rating may represent more qualitative and perception-based assessments, the IPCR Rating, a standardized evaluation method used by the Department of Education (DepEd, 2015), may concentrate on organized, quantitative metrics. This idea is supported by research by Darling-Hammond et al. (2017), which highlights how peer or subordinate evaluations of teachers often highlight facets of interpersonal skills, mentorship, and instructional efficacy that official performance review systems could miss.

Furthermore, a more balanced evaluation system that incorporates both quantitative (IPCR-based) and qualitative (peer evaluation-based) measurements is required, as indicated by the notable discrepancy between these two scores. According to research by Marzano (2017) and Stronge (2018), in order to guarantee impartiality, dependability, and a thorough grasp of teacher performance, efficient teacher assessment systems should integrate data from several sources.

Conclusion

The study points out the critical role of educational technology in enhancing the supervisory effectiveness of Master Teachers. The results indicate a strong positive relationship between their competence in educational technology and their ability to mentor, assess, and support teachers. While their performance in supervisory responsibilities is highly rated in formal evaluations, teachers' perceptions suggest room for further improvement. This discrepancy highlights the need for alignment in assessment methods to ensure that administrative evaluations reflect the actual impact of Master Teachers' supervision on their colleagues.

Moreover, the study reveals that Master Teachers acknowledge the significance of educational technology in both their instructional practices and professional development. They recognize its value in lesson planning, instructional supervision, and mentoring. However, challenges such as limited access to

digital resources, insufficient training, and infrastructure constraints hinder the full integration of educational technology into their research and supervisory roles. Addressing these challenges through targeted training programs and improved technological support will further enhance their instructional and supervisory effectiveness, ultimately fostering educational quality and teacher development in basic education institutions.

Recommendations

Based on the study results, the following recommendations are proposed to enhance the educational technology competence and supervisory performance of Master Teachers:

1. Policymakers may offer regular training and workshops to help Master Teachers improve their digital skills in instruction, supervision, and mentoring. These training programs can focus on practical applications, such as using digital tools for lesson planning, assessment, and online collaboration.

2. Policymakers can strengthen technology- based coaching and mentoring. Master Teachers may benefit from training using digital platforms for virtual coaching mentorship. Schools can encourage peer mentoring programs where experienced Master Teachers guide colleagues in integrating technology into teaching.

3. Schools may offer specialized trainings on digital tools for research, such as survey platforms, data analysis software, and online academic publishing since research was identified as an area for improvement. Collaborative research can be promoted among Master Teachers, allowing them to explore the impact of educational technology in their schools.

4. Schools may develop a system that integrates both standardized (IPCR) and peer-based assessments to provide a fair and comprehensive review of supervisory performance.

5. Schools can ensure that Master Teachers have access to updated technological tools, such as interactive whiteboards, learning management systems, and collaboration software. Reliable internet connectivity and digital learning platforms should also be provided to support technology-based supervision and mentoring.

6. Master Teachers may be encouraged to join online professional networks where they can exchange best practices, discuss emerging trends, and collaborate on educational projects. Schools can organize webinars and online forums to support knowledge sharing and continuous professional development.

7. Future researchers may explore how educational technology directly impacts student learning outcomes when implemented by Master Teachers. Additional studies can focus on developing more effective digital supervision models, ensuring that Master Teachers can maximize their roles as leaders and mentors in a technology-driven education system.

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