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The Effectiveness of ICT-Based Academic Supervision Model in Improving Teachers' Professional Competence at Santa Lusia Kindergarten, Archdiocese of Medan

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ABSTRACT

The research aims to accomplish three main things: first, to create a model for academic supervision that uses Information and Communication Technology (ICT) and website media to improve the professional competence of Santa Lusia Kindergarten teachers in Keuskupan Agung Medan. Second, to determine if the model can be implemented and evaluated in this educational setting. Third, to implement and evaluate the model. Making sure the model is feasible and usable in the real world is the main goal of the study. The result show that ICT-based academic supervision model that was developed proved effective in improving the professional competence of teachers at TK Santa Lusia. The N-Gain test results in cycle II, which reached 0.723 (72.34%), demonstrated the model's effectiveness, although it slightly decreased from cycle I (73.30%). With N-Gain values ranging from 46.15% to 88.89%, the model consistently provided significant improvements in teacher competence. The results indicate that the model effectively enhances teacher professional competence at Santa Lusia Kindergarten in Keuskupan Agung Medan.

KEYWORDS

academic supervision; teacher professional competence; Information and Communication Technology (ICT).

INTRODUCTION

Based on observations at Santa Lusia Kindergarten, researchers found a number of problems related to teacher competence. These problems include: 1) Lack of ability in choosing creative learning resources. The opportunity for teachers to choose learning materials that are in accordance with student characteristics is still 55%; 2) The ability to utilize the results of performance reflection is still lacking. Still 40% of educators are able to apply and utilize the results of reflection to improve their professionalism; 3) The ability of educators to implement modern learning is still lacking. Still 30% of educators are able to implement modern learning; 4) What is still lacking is the ability of educators to learn from various sources in order to keep up with the times. While 5% of teachers still have difficulty utilizing ICT properly, 40% of teachers are able to obtain information from various sources. Only 30% of teachers have the necessary skills to use ICT media effectively in their lessons. As a result of these findings, it is expected that managers will place more emphasis on academic supervision that gives instructors a sense of comfort and encourages them to update their teaching to students.

Based on Ministry of Education and Culture Regulation No. 6/2018, teachers are professionals whose main duties include coaching, mentoring, training and assessing students. Activities at primary, secondary and higher education levels are directed and coordinated by teachers. School principals are expected to have the necessary abilities to

carry out their obligations in the education unit, as stated in Minister of National Education Regulation No. 13/2007. In order to carry out these provisions, a principal must be able to manage others, own their own business and supervise others. Principals have a duty as supervisors to ensure that teachers are given the necessary resources to improve their teaching skills.

Academic supervision of instructors by utilizing appropriate methods and techniques, creating an academic supervision program to improve teachers' professionalism, and evaluating and analyzing the results of supervision are all part of the principal's supervisory skills (Aditya, P. T., & Ismanto, B, 2020). Principals are professional supervisors if they are able to motivate instructors to improve learning. Of course, principals must first professionalize educators before improving learning. To improve quality, principals should train, inspire and advise teachers. Principals should approach instructors who have the potential to become professionals. A teacher can be a peer tutor with other teachers when the principal has made them more professional. To make learning comfortable. This supports the idea that monitoring helps teachers develop their skills to meet learning objectives Ministry of Education and Culture (2015).

Teacher competency in Indonesia is still low (56.69) with an ideal score that should be (7.0). We can see that the average UKG score for North Sumatra province for all districts/municipalities together is at a low level of 52.43. Based on the low level of teacher competence in Indonesia as a whole, it can be concluded that the North Sumatra region also has a relatively low level of teacher competence. Therefore, there is a need to improve the level of expertise among educators.

To achieve this goal, one possible strategy is to establish an academic monitoring system that relies on ICT. The results of preliminary interviews with teachers in December 2023 at Santa Lusia Kindergarten, that supervision has been carried out by the principal every year, but the schedule that has been determined often changes not according to the schedule and the supervision carried out has not answered the needs of educators, in the implementation of supervision the teachers also feel afraid, uncomfortable as being watched, not relaxed in providing teaching to students because there are supervisors in the classroom, supervision is also not carried out at the teacher's initiative, the principal carries out supervision that is technical in nature only which has been scheduled, supervision administration has not been well documented. Various problems; 1) Principals who carry out academic supervision are still traditional and technical; 2) Principals implementing supervision lack the time to guide instructors; 3) The complexity of principal management; 4) Scheduled academic supervision is completed but not followed up; 5) Lack of time for face-to-face monitoring; 6) The results of academic supervision have not been implemented due to time constraints and have not improved teachers' professional competence; 7) Academic supervision has not solved the instructor's problems because it is still technical rather than advisory; 8) Supervision administration has not been well documented. These conditions require academic supervision on website media based on information and communication technology so that teachers can improve planning, implementation, and assessment of learning outcomes as well as their four main competencies, namely personality, professional, pedagogical, and social, along with their indicators (Sumiati, 2020).

The data presented so far shows that the level of teachers' professional competence is far from optimal. As a result, the professional competence of educators can be improved by implementing academic supervision centered on digital media and information and communication technology.

According to Sahertian, academic supervision is a professional service that provides direct and objective feedback to instructors, as well as systematic planning and careful

observation. Sahertian and Effendi's (2023) expert opinion argues that academic monitoring carried out by supervisors will serve as a motivational factor for educators to improve their teaching. Meanwhile, according to Fatmawati and Megawaty (2023), it emphasizes systematic planning. Both expert opinions are similar because they both emphasize the importance of cooperation for the successful implementation of supervision, thus creating a conducive environment. The implementation of supervision can be carried out through the use of ICT media websites, as technology enables administrative documentation.

The early 20th century marked the beginning of the application of information and communication technology in educational settings. Since then, several applications of this technology have been created with the aim of improving the effectiveness and efficiency of operations related to supervision. Ultimately, the goal of these applications is to obtain the highest possible educational outcomes, which will ultimately result in higher levels of competence and living standards, as well as the advancement of humanity.

With proper development and integration into supervisory operations, ICT has the potential to assist instructors in improving the delivery of the learning process. Teachers have the power to improve classroom learning processes and, by extension, student learning outcomes, through the use of information and communication technologies in teaching supervision. In addition to helping make learning activities more student-centered, information and communication technologies also have further additional functions Bolstad (2020) delivered a presentation on his research findings on the use of ICT in education in several developing countries. Based on his findings, he concluded that, with proper application, information and communication technology can, therefore, ICT has the ability to increase efficiency, increase the quantity of teaching while improving the quality of learning, expand access to education, and support better management and administration of educational institutions.

From the results of the professional assessment above, it is clear that educators in Indonesia, especially North Sumatra Province, do not yet have ideal competencies. Conventional academic supervision procedures are time-consuming, ineffective in time management, and still too focused on technical elements, all of which reduce the professional quality of teachers. In view of this, the most up-to-date option is to adopt an academic monitoring method that relies on ICT. In this way, educators can improve student achievement improve education management, and overall, improve the quality of education in Santa Lusia Kindergarten, North Sumatra and throughout Indonesia.

RESEARCH METHODS

This research will look at the effectiveness of the ICT Website development which has previously been created through the use of the ADDIE development method which is commonly called Research and Development (R&D). According to Sugiono (2015), Research and Development (R&D) A product is created by applying certain types of studies. In measuring the effectiveness in the development of website media ICT-based academic supervision in improving the professional competence of Santa Lusia kindergarten teachers.

This research was conducted at the Santa Lusia Kindergarten unit in Keuskupan Agung Medan. Initial observations were carried out in the even semester of the 2023-2024 school year starting from the initial observation stage. The initial observation implementation stage began in December 2023. (Not Completed Research is still in process).

Observation and interview guidelines, needs questionnaires, validation test questionnaires, and assumptions of product practicality are data acquisition methods used in this study. This research was conducted through direct observation at Santa Lusia Kindergarten. This observation was conducted by monitoring the implementation of

academic supervision. Furthermore, indirect observation was conducted with the help of cellular phones and internet media. Interviews were conducted in a semi-structured manner during the next phase. The researcher used this method to ask questions to teachers and principals spontaneously, taking into account the circumstances and situation of the informants at the time of the interview. There is still the practice of researchers preparing interview guidelines to ensure that the interview material does not elongate and remains focused. For the purpose of meeting the requirements of administrators and teachers, a questionnaire was used. The aim was to investigate the requirements that teachers and administrators have in relation to a technologically advanced academic supervision model that utilizes the internet media.

Simple language was used to develop the requirements questionnaire, which was designed to collect data in accordance with the research objectives. A list of written questions was then given to the respondents, and they were asked to answer. Respondents answered by choosing from pre-existing answer alternatives. The purpose of this instrument is to evaluate the feasibility of the product currently being developed. Language experts and practitioners utilize the validation test to obtain data regarding the quality of the academic supervision development model with ICT-based website media. The validation of this instrument will result in a questionnaire prepared for the purpose of data collection in the study. The expert lattice of the substance expert instrument is as follows.

The data analysis approach is carried out in accordance with the development method that has been carried out, namely by using quantitative descriptive analysis method. this research data was collected from the results of the material expert assessment and the responses of principals and teachers to the things that have been made. this information was obtained from the website tool. to determine the effectiveness of the things that have been designed, it is necessary to conduct an effectiveness test.

In this study, to analyze the data using one-group pretest-posttest design test and normalized gain test. this effectiveness test is carried out to see significant differences, namely the difference between the increase in teacher professional competence after and before using a type based academic supervision system with a paired t-test sample test.

RESULTS AND DISCUSSION

Effectiveness of ICT-based Academic Supervision Model Development for Improving Teachers' Professional Competence

First Trial Results

The limited trial was applied by implementing the product of the type based academic supervision model to respondents totaling 8 Santa Lusia Kindergarten teachers in Keuskupan Agung Medan. This stage is a continuation after conducting internal product trials to experts and making revisions according to suggestions for improvement.

Table 1. *Significance* (2-tailed) *Paired Sample T-Test* (Limited Trial)

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test - Post-Test	-49,500	10,677	3,775	-58,426	-40,574	-13,113	7	,000

Based on the test hypothesis, if the significance value is <0.05 then H0 is rejected and Ha is accepted, indicating that there is a significant difference in the effectiveness of the implementation of ICT-based academic supervision. However, if the significance value > 0.05 then H0 is accepted and Ha is rejected, which indicates that there is no significant difference in the effectiveness of the implementation of ICT-based academic supervision. Table shows that the significance value (2-tailed) is 0.000 which means that the significance value is <0.05. This result indicates that the implementation of ICT-based academic supervision in the limited trial (cycle I) can significantly improve the effectiveness of professional competence of Santa Lusia kindergarten teachers in Keuskupan Agung Medan.

Second Trial Results

The broad field trial was applied by implementing the product of developing an ICT-based academic supervision model to all 20 Santa Lusia kindergarten teachers in Keuskupan Agung Medan. This stage is a continuation after the limited trial (I) in order to re-implement. This broad field trial was conducted to measure the effectiveness of teachers' professional competence.

Table 2. *Significance (2-tailed) Paired Sample T-Test* (Wide Field Trial)

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test - Post-Test	-46,000	9,926	2,220	-50,646	-41,354	-20,725	19	,000

a) Based on the results of the paired sample t-test on the broad field trial (II), a t-value of -20.725 with a p-value of 0.000 was obtained. Because the p-value is smaller than 0.05, the null hypothesis (which states that there is no significant difference between the pre-test and post-test) is rejected. This shows that there is a significant difference between the pre-test and post-test, with the post-test having a higher value. This result indicates that the implementation of the ICT-based academic supervision model development in the broad field trial (II) can significantly improve the effectiveness of the professional competence of Santa Lusia Kindergarten teachers in Keuskupan Agung Medan.

The effectiveness test aims to identify potential improvements and further development so that the system can continue to evolve in accordance with technological developments and teacher needs that may change over time. By measuring the effectiveness of the ICT-based academic supervision model, it can ensure that the investment in technology provides significant added value in supporting operational activities. The effectiveness test was conducted by distributing pretest and posttest competency questions to obtain N-Gain Score values.

Table 3. Statistical Data of N-Gain Score Test Results on wide Field Trial (II)

Average					
Pretest	Posttest	N-Gain Score	Category	Percent N-Gain	Criteria
36,80	82,80	0,723	High	72,34%	Effective Enough
Percent N-Gain Max		88,89%			
Percent N-Gain Min		46,15%			

Based on the results of the N-Gain test in the broad field trial (cycle II), the average pretest was 36.80 and the posttest was 82.80, with an N-Gain Score of 0.723 which is included in the high category, and the N-Gain percentage of 72.34%, which indicates that the ICT-based academic supervision model is quite effective. The maximum N-Gain percentage was recorded at 88.89%, while the minimum N-Gain percentage was 46.15%.

This study aims to develop and test the effectiveness of an Information and Communication Technology (ICT)-based academic supervision model for teachers at Santa Lusia Kindergarten in Medan Archdiocese. The results showed that the ICT-based supervision model was effective in improving teachers' professional competence, as evidenced by the results of the limited trial (cycle I) and the wide field trial (cycle II). This finding is relevant to a number of previous studies that explored the use of ICT in developing teacher professionalism at various levels of education.

This study confirms that ICT-based supervision can significantly improve teachers' professional competence, both in cycle I and cycle II. The paired sample t-test results showing a significance value of 0.000 in both cycles confirmed that the application of this model had a positive effect on improving teachers' knowledge and skills. This is in line with the findings in a study conducted by Sulastri (2019), which stated that ICT-based supervision at SDN 013 Bukit Bestari Tanjungpinang was also able to significantly improve teacher performance. Handayani and Sukirman (2020) also found that ICT-based supervision helps improve the learning process and enables teachers to develop in professional collaboration, which is crucial to improving the quality of education at the primary level and early childhood education.

The high N-Gain value in both cycles (73.30% in cycle I and 72.34% in trial II) indicates the effectiveness of the ICT-based supervision model in improving teacher competence. These results support the findings in a study by Fauzi et al (2021) which showed that the use of ICT-based supervision can accelerate the process of improving teacher skills. In cycle I, the higher N-Gain results indicate that the implementation of this model has a major impact in the early stages of implementation, and although it decreased slightly in cycle II, the high N-Gain value indicates that this model is still effective in improving teacher skills continuously. This study provides evidence that the application of ICT in academic supervision not only improves academic competence but also enables more flexible and responsive learning to the needs of teachers in kindergartens. In comparison, Yulianto et al. (2023) showed that web-based supervision can facilitate monitoring of teacher performance in various schools, including those based on early childhood education (PAUD). This is relevant to the conditions at Santa Lusia Kindergarten, where teachers can more easily access learning materials, communicate with supervisors, and get real-time feedback through ICT-based platforms.

The application of the ICT-based academic supervision model at Santa Lusia Kindergarten shows that this model has the potential to be implemented in various other educational institutions. Research by Fauzi et al. (2021) on ICT-based supervision in junior high schools also indicates that the use of ICT in supervision not only improves teacher performance but also improves the overall quality of education, which is very valuable for early childhood education that requires more intensive management and monitoring.

The results of this study indicate that information and communication technology can be used as an effective tool in academic supervision to improve teacher professional skills, especially at the PAUD level. The ICT-based supervision model allows teachers at Santa Lusia Kindergarten to receive more adaptive training, optimize game-based learning, and strengthen their self-reflection on classroom management and child development. The implications of this study indicate that with further development, this ICT-based supervision

model has the potential to be applied more widely in other educational institutions, so that it can improve the overall quality of education at the kindergarten level.

CONSLUSION

Based on the results of limited trials and extensive field trials, the developed ICT-based academic supervision model has proven effective in improving the professional competence of teachers at Santa Lusia Kindergarten. In cycle II, the results of the N-Gain test showed a value of 0.723 with an N-Gain percentage of 72.34%, which although slightly decreased compared to cycle I, still shows the effectiveness of the Information and Communication Technology (ICT)-based academic supervision model. The high N-Gain value, with a variation between 46.15% to 88.89%, illustrates that this model has succeeded in improving overall teacher competence. This is in line with the findings from cycle I which showed that the ICT-based supervision model was very effective in improving teacher abilities, with an N-Gain reaching 73.30%.

REFERENCES

Aditya, P. T., & Ismanto, B. (2020). Model Peningkatan Mutu Pendidikan Melalui Supervisi Akademik Berbasis Web. *Refleksi Edukatika : Jurnal Ilmiah Kependidikan*, *11*(1), 70–78. https://doi.org/10.24176/re.v11i1.4805

Bolstad, R. (2020). How can New Zealand schools respond to climate change? *Set:Research Information for Teachers*, *3*, 30–39. https://doi.org/10.18296/set.0184

Fatmawati, D., & Megawaty, D. A. (2023). Aplikasi Supervisi Dosen Berbasis Web Di Universitas XYZ. *Jurnal Informatika Dan Rekayasa Perangkat Lunak*, *4*(3), 270–283. https://doi.org/10.33365/jatika.v4i3.3100

Fauzi, M., Warisno, A., & Hidayah, N. (2021). Pelaksanaan Supervisi Kepala Madrasah dalam Meningkatkan Kinerja Guru di Madarasah Aliyah Hidayatul Mubtadiin Kecamatan Jati Agung Kabupaten Lampung Selatan. *JURNAL AN-NUR: Kajian Ilmu-Ilmu Pendidikan Dan Keislaman*, *7*(2), 68–89. https://journal.an-nur.ac.id/index.php/annur/article/view/98

Handayani, L., & Sukirman. (2020). Kontribusi Supervisi Kepala Sekolah Pada Peningkatan Kualitas Pembelajaran Di Smp 3 Bae Kudus. *Journal Of Education, Psychology and Counselling*, *2*(1), 297–310. https://ummaspul.ejournal.id/Edupsycouns/article/view/479

Yulianto, M., Egar, N., & Nurkolis. (2023). Pengembangan Model Supervisi Akademik Berbasis Web Bagi Sekolah Menengah Kejuruan. *Didaktik : Jurnal Ilmiah PGSD STKIP Subang*, *9*(2), 1596–1503. https://doi.org/10.36989/didaktik.v9i2.832

Ministry of Education and Culture. (2015). Ministry of Education and Culture Regulation Number 17 Year 2015 about Organisation and work procedures of the Principal Development and Empowerment Institute.

Sahertian, P., & Effendi, Y. R. (2023). Principal's Academic Supervision Based on Humanistic Spiritual Values to Increase Student Achievement Motivation. *International Journal of Innovation and Learning*, *34*(1), 1. https://doi.org/10.1504/ijil.2023.10054867

Sugiono. (2015). Metode Penelitian Metode Penelitian. *Metode Penelitian Kualitatif*, *17*, 43. http://repository.unpas.ac.id/30547/5/BAB III.pdf

Sulastri. (2019). Supervisi akademik berbasis TIK di SDN 013 Bukit Bestari Tanjung pinang. *Indonesian Journal of Educational Development*, *3*(4), 410–417. https://doi.org/10.5281/zenodo.4781861

Sumiati, D. (2020). Pengembangan Bahan Ajar Cerita Anak Berbasis Cerita Rakyat Banten Untuk Siswa SD. *Jurnal Teknologi Pendidikan Dan Pembelajaran*, 2(11), 271–287.