

↵↵An Online Mentoring Management Model for School Supervisors: Enhancing the Managerial Competence of Public Senior High School Principals in Southeast Aceh

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Abstract: This study aims to analyze the characteristics, feasibility, and effectiveness of an online (website-based) supervisory mentoring management model to improve the managerial competence of public senior high school principals in Southeast Aceh Regency. Employing a research and development approach with the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation), the study involved 20 principals as the research sample. Data were collected through observation, interviews, documentation, questionnaires, and tests. The results show that: (1) the model is characterized by usability, clarity, aesthetics, and web accessibility; (2) expert validation confirms its high feasibility; and (3) implementation of the model significantly enhances principals' managerial competence. In conclusion, the online supervisory mentoring management model is both feasible and effective in strengthening the managerial competence of senior high school principals in the region

Keywords: Supervisory Mentoring, Website-Based Model, Managerial Competence

Introduction

Mentoring has become increasingly popular in recent years, particularly in leadership development, including mentoring for school principals (Smith, 2007). The role of principals has continued to evolve, shifting from primarily performing managerial functions to serving as instructional leaders with complex and demanding responsibilities. Principals are expected to improve school quality and student achievement while simultaneously supporting teachers in delivering effective learning activities (Lynch, 2021; Marzano, Waters, & McNulty, 2005). Unfortunately, many principals still demonstrate low levels of competence due to limited skills in effective school management, insufficient supervision and guidance from school supervisors, and inadequate professional development (Dimmock & Walker, 2020).

A mentor is generally described as someone who provides advice, support, and guidance to a mentee to facilitate career and personal development (Kram, 1988; Carruthers, 1993; Bell, 2000; Roberts, 2000). Mentoring involves a process in which mentors assist mentees through purposeful interactions designed to facilitate and support—sometimes to even trigger—significant changes in their personal and professional lives. It is not limited to skills training but also aims at developing the whole person (Clutterbuck & Megginson, 1999). Thus, mentoring represents a special mode of learning where mentors not only support but also productively challenge mentees to achieve progress.

Field data further illustrate this gap. According to the Ministry of Education and Culture of the Republic of Indonesia, the average score on the 2019 Principal Competency Test was 56.37, with Yogyakarta achieving the highest score (61.47) and North Maluku the lowest (52.09). Aceh Province scored 53.89, indicating that principals' managerial competence was below the national average (Kemendikbud, 2019). Similarly, results of the 2024 Principal Competency Assessment (AKKS) for public senior high schools in Southeast Aceh Regency show an average score of 49.55, categorized as low. Further analysis revealed an average managerial competence score of 42.25, also considered low (Disdik Aceh, 2024).

These findings are consistent with statements from Dimmock and Walker (2020) and Smith (2020), who identify several factors contributing to low managerial competence among principals: (1) limited quality and comprehensiveness of education and training programs; (2) insufficient managerial experience to address school challenges; (3) inadequate supervision and guidance from school supervisors; (4) lack of motivation and initiative for professional development among principals; (5) poor-quality mentoring that fails to provide essential knowledge and skills; (6) infrequent and low-intensity mentoring interactions; and (7) principals' negative perceptions of mentoring, which may reduce their commitment to professional growth.

This study aims to: (1) identify the characteristics of an online (website-based) supervisory mentoring management model for improving the managerial competence of public senior high school principals in Southeast Aceh Regency; (2) develop a feasible online supervisory mentoring management model; and (3) examine the effectiveness of the model in enhancing principals' managerial competence.

This research contributes to the discourse on supervisory mentoring models by integrating a website-based approach. Practically, the findings may inform policymaking related to the implementation of supervisory mentoring for improving the managerial competence of senior high school principals in Southeast Aceh. Furthermore, the study offers recommendations for refining and strengthening principals' managerial competencies through the adoption of effective online mentoring practices.

Literature Review

A Brief Overview of Mentoring

Mentoring can be simply described as the process of "guiding, supporting, and empowering individuals who are seeking their way into a profession" [1]). It has also been defined as "a dynamic, reciprocal relationship in the workplace between a more experienced career holder (mentor) and a novice (protégé), aimed at fostering the career development of both participants and serving as an effective teaching and learning strategy, particularly in the field of continuous professional development" (Vonk, 1993; Kufakwami, Mtetwa, & Kwari, 2023). Mentoring has long been recognized as an established educational model to support professional development, particularly among scientists and physicians (Nganga, C., Bowne, M., & Stremmel, A. (2020)). In practice, the personal qualities of the mentor play a crucial role in shaping the mentor-mentee relationship. A mentor may serve as a coach, leader, confidant, and close companion (Colvin & Ashman, 2010).

The presence of an experienced mentor is essential in helping mentees solve problems and represents an important aspect of the mentoring partnership. Compatibility in terms of interests and personality also influences satisfaction with the mentoring process, as effective mentoring typically emerges from strong interpersonal compatibility (Lyons & Perrere, 2014). More importantly, human development and improved learning outcomes remain the central premises of mentoring schemes (Allen & Eby, 2011). Jacobi's (1991) conceptualization of mentoring relationships—emotional and psychological support, career and professional development assistance, and role modeling—continues to serve as a framework in mentoring research. This was later expanded by Crisp (2009) and Nora & Crisp (2007) to include knowledge support. Colvin and Ashman (2010) further refined the framework

by emphasizing that the mentor's role extends beyond a functional relationship to encompass multiple dimensions of support.

Dominguez and Hager (2013) reviewed the literature on mentoring and identified three theoretical perspectives. The developmental theory approaches mentoring as a hierarchical process occurring through sequential stages from initiation to conclusion. The learning theory views mentoring as a co-learning process in which mentors facilitate rather than direct the mentee's growth. The social theory positions mentors as role models who not only provide information but also model behaviors and foster social learning. Scholars widely agree that mentoring yields significant benefits for both mentees and mentors (North, Samardzic, & Cohen, 2017). Indeed, in skill development and professional networking, mentoring has proven effective, as most mentees report satisfaction with their professional advancement (Russell, Hancock, & McCullough, 2007; Slocum & Scholl, 2013).

Online supervisory mentoring offers new opportunities to strengthen principals' competence and boost confidence in decision-making. Despite communication challenges, appropriate use of technology can help address difficulties and support more flexible learning (Rodriguez & Faber, 2023; Yazici & Altun, 2022). Furthermore, research by Williams & Chivers (2020) and Harris & Jones (2021) highlights principals' perceptions that online supervisory mentoring provides easier access to information, enables more frequent interactions, and enhances managerial skills. Online platforms can also facilitate faster and more effective feedback while supporting collaborative discussions to strengthen school leadership capacity.

The Concept of Principal Competency Development in Indonesia

In Indonesia, the preparation and development of school leaders are now regarded as fundamental to school and system improvement (Sumintono, Sheyoputri, Jiang, Misbach, & Jumintono, 2015). The regulation of school leadership is stipulated in the Ministry of National Education Regulation No. 13 of 2007 concerning the Standards for Principals, which states that a school principal must possess five minimum dimensions of competence: personal, managerial, entrepreneurial, supervisory, and social competence. Furthermore, the principal competency model was updated through the Directorate General of Teachers and Education Personnel Regulation No. 7327/B.B1/HK.03.01/2023, which classifies competencies into three categories: personal competence, social competence, and professional competence.

Each competency consists of levels 1 through 5, with each level marked by specific verbs. For example, level 1: understanding, level 2: applying, level 3: analyzing factors, level 4: evaluating implementation, and level 5: mentoring peers (peer mentoring) through the application of self-agency. This indicates that the practice of mentoring has already been formally embedded in Indonesian educational regulations. It is expected that by defining the required competencies, school principals will be better equipped to achieve quality learning processes and educational outcomes.

Several research studies and articles provide critical perspectives on principal competencies in Indonesia. Jones and Hagul (2001) observed that "principals have little authority in running schools or allocating resources, and they are usually not trained to manage or lead schools effectively." Bjork (2005) also highlighted the insufficient capacity of principals in terms of expertise and experience to address the challenges and opportunities posed by educational autonomy. A literature review by Laiv (2022) emphasized that managerial competence among principals includes the ability to develop planning across various levels, establish school organizations according to needs, exercise leadership in optimizing resources, manage change, and develop schools aligned with efficient educational organizations. Principals are also expected to create a conducive and innovative school culture that supports student learning.

The role of principals in managing school resources is crucial to ensuring that all educational elements function optimally. Efficient management encompasses human resources as well as physical and financial resources (Leithwood & Jantzi, 2000). However, in Indonesia, principals often face challenges arising from multiple managerial responsibilities. In addition, specific skills and experience

are required to provide constructive and effective feedback. To overcome such challenges, mentoring support becomes essential (Supadi, Soraya, Muhammad, & Halim, 2021).

Research and Methodology

This study employed a Research and Development (R&D) design consisting of two stages: a qualitative method in the first stage to obtain the product design, and a quantitative method in the second stage to test the effectiveness of the developed product (Sugiyono, 2011). The Online-Based Supervisory Mentoring Management Model (Website) was developed to enhance the managerial competence of public high school principals (SMA Negeri) in Southeast Aceh Regency using the ADDIE model. The study was conducted in public high schools in Southeast Aceh Regency, Aceh Province, from November 2024 to March 2025. The research subjects were high school principals, with a population and sample consisting of 20 principals and school supervisors selected through purposive sampling techniques. Data were collected using questionnaires, interviews, focus group discussions (FGD), observation, document study, expert validation, and tests.

Results and Discussion

This study employed a Research and Development (R&D) design. The Online-Based Supervisory Mentoring Management Model (Website) to improve the managerial competence of public high school principals in Southeast Aceh Regency was developed using the ADDIE model. The stages and results of the development process are described as follows:

Analysis Phase

The analysis phase represents the initial stage in developing the model, which involves identifying the problems related to the low managerial competence of school principals. According to data from the Ministry of Education and Culture of the Republic of Indonesia, the average score of the School Principal Competency Test in 2019 was 56.37. The highest score was recorded in Yogyakarta Province (61.47), while the lowest was in North Maluku Province (52.09). Meanwhile, Aceh Province scored 53.89, which falls into the low category as it was below the national average (56.37) (Kemendikbud, 2019). Furthermore, the results of the 2024 School Principal Competency Assessment (Asesmen Kompetensi Kepala Sekolah—AKKS) for public high school principals in Southeast Aceh Regency showed an average score of 49.55, categorized as low. Similarly, the results of the 2024 managerial competency assessment of public high school principals in Southeast Aceh Regency revealed an even lower average score of 42.25, also within the low category (Disdik Aceh, 2024).

In this phase, a content analysis was also conducted. The results of the Focus Group Discussion (FGD) indicated that the required materials for principals in Southeast Aceh Regency should be relevant to improving managerial competence, with indicators including: (1) mastery of school program planning, (2) mastery of school development, (3) mastery of human resource leadership in schools, (4) mastery of school resource management, and (5) mastery of school facilities and infrastructure management.

A media analysis was also performed. Based on the findings, the low managerial competence of principals and the lack of effectiveness in supervisory mentoring could be addressed more efficiently and engagingly if the process was conducted online, integrated into a platform familiar to principals. The analysis indicated that a website-based medium was the most suitable for implementing the supervisory mentoring model in Southeast Aceh Regency.

The objective formulation stage, based on observations and interviews, showed that the primary goal of effective supervisory mentoring is to improve principals' competence in managing educational units. The expected objectives included establishing a clear direction for the mentoring program, providing structured mentoring activities, and ensuring benefits for principals through discussions,

experience sharing, learning materials, and resources. Therefore, the objectives of developing the website-based supervisory mentoring model were: (1) to set the direction of the supervisory mentoring program to enhance principals' managerial competence; (2) to implement socialization of the model and monitor the implementation of the mentoring program through the website; and (3) to evaluate the implementation of the website-based supervisory mentoring model as input for decision-making in future supervisory mentoring development.

Thus, the analysis phase served as a foundation for aligning content needs, media selection, and goal formulation to ensure that the website-based supervisory mentoring management model effectively enhances the managerial competence of school principals.

Design Phase

The design phase involves developing the management of Online (Website-Based) School Supervisors Mentoring to improve the managerial competence of school principals. This stage includes:

First, the procurement of domains and hosting, interface design (product prototype), development of flowcharts, storyboards, preparation of implementation guidelines for the website-based school supervisor mentoring management model, preparation of participant workbooks (school principals) for online mentoring, and expected outputs of the mentoring management process. This design stage is conceptual in nature but serves as the foundation for subsequent development processes. Product design, flowchart creation, storyboard development, and initial product drafts are integral components of the model design phase.

Second, the design of the Online (Website-Based) School Supervisor Mentoring Management Model Guidebook. This guidebook draft serves as an initial reference that will later be validated by experts. The mentoring management guidebook covers several aspects, including philosophical foundations, model concepts, model structure, model design, contextual elements, and implementation mechanisms.

Third, the design of the Implementation Guidelines for the Online (Website-Based) School Supervisor Mentoring Management Model. These guidelines are specifically created to serve as references during the implementation of mentoring activities.

Fourth, the design of the School Supervisors' Online (Website-Based) Mentoring Guide. This guidebook serves as an initial draft tutorial that supervisors can use during mentoring activities.

Fifth, the development of evaluation and assessment criteria. A detailed and comprehensive evaluation framework is designed for supervisors conducting online mentoring to enhance principals' managerial competence. This includes: Principal Progress Evaluation; Learning Quality and Content Evaluation; Evaluation of Practical Application of Content in Schools; Evaluation of Overall Program Effectiveness; and the Preparation of Evaluation Reports and Mentoring Programs. Based on the evaluation results, improvement plans are formulated for subsequent mentoring programs. For instance, if certain content is not well understood, additional modules or more interactive teaching methods may be prepared. Furthermore, an evaluation is conducted to determine whether other elements need to be incorporated, such as new measurement tools for assessing principals' managerial competencies or more intensive feedback mechanisms from principals throughout the process.

Development Phase

The development phase is a continuation of the design phase that has been previously created. This stage includes:

First: Pre-Development. In the pre-development stage, the researcher prepared a design (blueprint) consisting of the framework of domain and hosting, user interface design (product prototype), flowchart, storyboard, preparation of the implementation guidebook for the online-based (website) school supervisory mentoring management model, the workbook for participants (school

principals) in online-based mentoring, and the output materials of the school supervisory mentoring management. The researcher then determined the structure of the training module, which consisted of the cover page, introduction, table of contents, list of figures, list of tables, foreword, learning activities, evaluation, conclusion, bibliography, and appendices.

Second: Preparation of the Supervisor's Guidebook for Online-Based Mentoring. This guidebook consists of four (4) main chapters. Chapter I, Introduction, contains: Background, Objectives, Benefits, Expected Outcomes, and Scope. Chapter II includes: Definition of School Supervisory Mentoring, Concepts of School Supervisory Mentoring, Objectives and Benefits, Principles, Procedures/Stages of Mentoring, Approaches, Methods, and Techniques of Supervisory Mentoring. Chapter III consists of: Preparation of the Mentoring Program Plan, Implementation Schedule, Implementation Procedures, and Steps in Mentoring. Chapter IV presents reporting procedures for online-based school supervisory mentoring.

Third: Preparation of the School Principal's Guidebook for Online-Based Mentoring. The principal's workbook to be used by school principals consists of seven (7) main chapters. Chapter I, Introduction, contains: Background, Objectives, Benefits, Expected Outcomes, and Scope. Chapter II presents materials on the principal's ability to develop school program planning along with achievement indicators. Chapter III focuses on the principal's ability to develop school programs and their achievement indicators. Chapter IV emphasizes the principal's ability to lead human resources in schools. Chapter V elaborates on the principal's ability to manage school resources along with achievement indicators. Chapter VI discusses the principal's ability to manage school facilities and infrastructure. Finally, Chapter VII contains the conclusion.

Fourth: Preparation of the User Guide for the Online Application. This guidebook is intended for both school supervisors and school principals as system users. The tutorial book consists of three (3) main sections. Section I: Introduction, Objectives, and Benefits. Section II: Tutorial for school principals on using the application. Section III: Tutorial for school supervisors on using the application. At this stage, the researcher designed the online-based supervisory mentoring management model for enhancing principals' managerial competence by reviewing references and mapping the required content within the online application.

Fifth: Drafting the Model Framework. The draft framework was developed after conducting field studies, document reviews, observations, and interviews with supervisors and principals in Aceh Tenggara Regency, while maintaining coordination with the District Education Office. The draft model and modules were then discussed through a focus group discussion (FGD). Topics included the model's philosophy, concepts, structure, design, contextual aspects, and mechanisms. The researcher prepared a draft concept model, which was then reviewed and improved based on input, feedback, and criticism from FGD participants. Participants included the dissertation supervisor, co-supervisor, subject-matter experts, media experts, the Head of the Provincial Education Office, the Head of SMA and PKLK Division of the Provincial Education Office, the Head of the Regional Education Office Branch (covering Bener Meriah, Aceh Tenggara, Gayo Lues, and Aceh Tengah), the Association of High School Principals (MKKS), and school supervisors.

Sixth: Validation. Validation was conducted to determine whether the developed model and training modules were feasible for trial. Based on the results of material expert validation, the model achieved a score of 89% (very good category), while media expert validation obtained 84.76% (highly feasible). Thus, it can be concluded that, in terms of both material and media feasibility, the Online-Based Supervisory Mentoring Management Model to improve the managerial competence of public high school principals in Aceh Tenggara Regency is considered very good and feasible for use. Based on the FGD results, the final design of the Online-Based Supervisory Mentoring Management Model can be seen in Figure 1 below.

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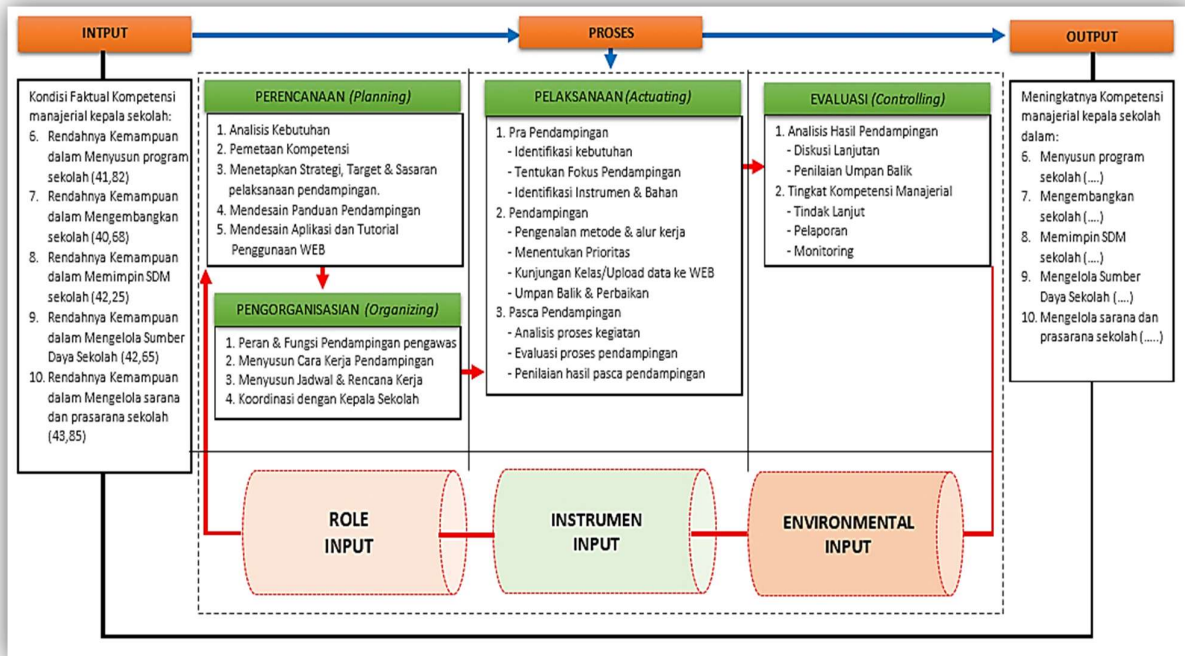


Figure 1. Design of the Online (Website-Based) Mentoring Model for School Supervisors to Enhance the Managerial Competence of Public Senior High School Principals in Southeast Aceh Regency.

The Online (Website-Based) Mentoring Management Model for School Supervisors developed in this study has several advantages. (1) The model consists of three key components: input, process, and output. The input component refers to the low level of principals' managerial competence, ranging from 0–50. The process component includes: (a) the planning stage, which involves needs assessment, competence mapping, defining strategies, objectives, and resources, as well as designing guidelines and applications; (b) the organizing stage, which involves defining the roles and functions of supervisors, developing mentoring procedures, preparing schedules, and conducting socialization and coordination with principals and the education office; (c) the implementation stage, which includes pre-mentoring activities, the mentoring process through the provided media or application, and post-mentoring evaluation; and (d) the evaluation stage, which involves analyzing mentoring outcomes, providing feedback, reporting, and monitoring. (2) The research findings revealed the characteristics of the developed model, namely: (a) the method is conducted online through a website-based platform; (b) the mentoring actors are school supervisors; (c) it is flexible and user-friendly to support mentoring objectives; (d) the implementation consists of pre-mentoring, mentoring, and post-mentoring stages; and (e) clarity, meaning the objectives of the mentoring are explicitly aligned with the users' needs.

The characteristics of this online (website-based) mentoring management model for school supervisors in enhancing principals' managerial competence are categorized into six key aspects: (1) Philosophical Foundation: based on the belief that effective education and school management can be achieved through sustainable collaboration between principals and supervisors; (2) Conceptual Framework: the core concept of the model is to utilize a website-based platform as an integrated medium for collaboration between supervisors and principals; (3) Structural Framework: the structure of the model consists of several interrelated components that work synergistically to improve principals' managerial competence; (4) Design Framework: the model design is flexible, with learning materials presented in modular form and selectable according to principals' needs; (5) Contextual Adaptability: the model is highly contextual, allowing adaptation to the conditions and challenges

faced by different principals in various regions or schools; and (6) Operational Mechanism: consisting of systematic stages, including registration and initial orientation, selection of learning modules, online learning, discussion and consultation, assignments and evaluations, and monitoring and reporting, where supervisors track principals' progress through available reports on the platform and provide follow-up recommendations based on evaluation results.

Implementation Phase

The first trial, or limited trial, was conducted with five principals of public senior high schools (SMA Negeri) in Aceh Tenggara District. Based on the results of this limited trial, the aspect of ease of use and navigation obtained an average score of 23.80 with a percentage of 95.20, categorized as highly feasible. The aspect of clarity of presentation obtained an average score of 43.80 with a percentage of 95.56, categorized as highly feasible. The aspect of aesthetics obtained an average score of 23.80 with a percentage of 95.20, also categorized as highly feasible. Meanwhile, the aspect of instructional quality obtained an average score of 19.00 with a percentage of 95.00, categorized as highly feasible. Thus, based on user evaluations, it can be concluded that the online (website-based) school supervisor mentoring management model is highly feasible for use.

The second trial, or broader implementation, was carried out with 15 school principals in Aceh Tenggara District. The results of the broader trial showed that the principals' managerial competence in the pretest obtained an average score of 59.33, categorized as low, while the posttest obtained an average score of 84.80, categorized as very high. Therefore, it can be concluded that the online (website-based) school supervisor mentoring management model in the broader trial can significantly improve principals' managerial competence.

In the limited trial, the indicators showed improvement as follows: (A) the ability to develop school planning increased from an average score of 68.80 to 88.00; (B) the ability to develop school activities increased from 64.00 to 68.00; (C) the ability to lead human resources in schools increased from 60.00 to 85.00; (D) the ability to manage school resources increased from 57.50 to 87.50; (E) the ability to manage school facilities and infrastructure increased from 60.00 to 84.00.

Furthermore, in the broader trial, the indicators showed improvement as follows: (A) the ability to develop school planning increased from 58.67 to 86.67; (B) the ability to develop school activities increased from 65.33 to 85.33; (C) the ability to lead human resources in schools increased from 61.67 to 88.33; (D) the ability to manage school resources increased from 58.33 to 78.33; (E) the ability to manage school facilities and infrastructure increased from 54.67 to 85.33.

The results of the paired sample t-test from both trials indicated an increase in the principals' average test scores after the model was implemented. This finding demonstrates that the implementation of the website-based school supervisor mentoring management model effectively improves the managerial competence of public senior high school principals in Aceh Tenggara District.

In addition, the results of the User Satisfaction Test are presented in the following table:

Table. User Satisfaction Assessment Results (School Principals)

No	Respondent	Aspek Yang Dinilai				Total
		Ease of Use	Clarity of Presentation	Usefulness	Effectiveness	
1	Principals 11	24	23	23	23	93
2	Principals 12	24	23	24	23	94

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3	Principa 13	24	23	24	23	94
4	Principa 14	24	23	24	23	94
5	Principa 15	24	23	24	23	94
6	Principa 16	24	24	24	23	95
7	Principa 17	23	23	24	23	93
8	Principa 18	23	23	24	23	93
9	Principa 19	23	23	24	23	93
10	Principa 110	24	23	24	23	94
11	Principa 111	24	23	23	24	94
12	Principa 112	23	23	23	24	93
13	Principa 113	23	24	24	23	94
14	Principa 114	23	23	23	23	92
15	Principa 115	23	23	24	23	93
16	Principa 116	23	23	23	23	92
17	Principa 117	23	23	24	24	94
18	Principa 118	23	23	23	23	92
19	Principa 119	23	23	24	23	93
20	Principa 120	23	23	23	23	92
Score:		46 8	462	473	463	18 66
Percentage:		93 ,60	92,4 0	94,60	92,60	
Average (%):		93,30				

Source: Primary Research Data, 2025

Based on the results above, the aspect of Ease of Use obtained a score of 468 (93.60%), categorized as very high. Clarity of Presentation reached a score of 462 (92.40%), very high. Usefulness obtained the highest score, 473 (94.60%), also very high. Effectiveness scored 463 (92.60%), likewise very high. Overall, the user satisfaction level among principals reached an average percentage of 93.30%, categorized as very high. Furthermore, user satisfaction assessments conducted with both school supervisors and principals consistently showed very high levels, with percentages of 92.50% (supervisors) and 93.30% (principals). These findings indicate that the implementation of the website-based school supervisor mentoring management model is highly satisfactory and effective in enhancing the managerial competence of public senior high school principals in Aceh Tenggara District.

Evaluation Phase

The N-Gain Score (normalized gain) test was conducted to determine the effectiveness of the website-based school supervisor mentoring management model in improving the managerial competence of public senior high school principals in Aceh Tenggara District. The N-Gain Score was calculated by comparing the difference between pretest and posttest results in both limited and large-scale trials.

Table. N-Gain Score Test in the Limited Trial

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Ngain_Score	5	0	1	.57	.082	.183
Ngain_Persen	5	27	73	56.67	8.274	18.502
Valid N (listwise)	5					

Based on the results, the N-Gain Score in the limited trial was 0.57, which falls into the moderate category ($0.3 \geq g \geq 0.7$). The percentage N-Gain reached 56.67%, categorized as effective.

Table. N-Gain Score Test in the Large-Scale Trial

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Ngain_Score	15	0	1	.59	.138
Ngain_Persen	15	32	79	59.21	13.812
Valid N (listwise)	15				

The large-scale trial yielded an N-Gain Score of 0.59, also in the moderate category ($0.3 \geq g \geq 0.7$). The percentage N-Gain was 59.21%, categorized as effective. According to Husein et al. (2015) and Hake (1999), the effectiveness classification is as follows: Gain (g) < 40 (ineffective), $g \geq 40$ –55 (less effective), $g \geq 56$ –75 (effective), and $g > 76$ (highly effective). The calculation shows that the average N-Gain Score in the limited trial (Trial I) was 56.67%, with a minimum value of 38.89% and a maximum of 69.23%, categorized as effective. In the large-scale trial (Trial II), the average N-Gain Score was 59.21%, with a minimum of 38.89% and a maximum of 78.57%, also categorized as effective. The descriptive distribution of N-Gain Scores in Trial I showed that 20% of principals obtained < 40, another 20% scored 40–55, and the majority (60%) scored 56–75, while none exceeded > 75. In Trial II, 13.33% of principals scored < 40, 26.67% scored 40–55, 46.67% scored 56–75, and 13.33% exceeded > 75. The graphical distribution further confirmed that the average N-Gain Scores were 56.67% (Trial I) and 59.21% (Trial II). Since both values are above the > 55 threshold, the model is considered effective. The effectiveness

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of the model is reinforced by the results of the Paired Sample t-Test. Both trials showed Sig. (2-tailed) < 0.05, meaning H_0 was rejected and H_a accepted, which indicates a significant difference between pretest and posttest results. Therefore, it can be concluded that the implementation of the website-based school supervisor mentoring management model is effective in improving the managerial competence of public senior high school principals in Aceh Tenggara District.

Descriptively, the distribution of the average N-Gain can be presented in the form of the following table and bar chart:

Table. Distribution of N-Gain Scores in the Limited Trial (I)

Interval	Limited Trial (I)		
	<i>F</i>	Percentage (%)	Cumulative Percentage (%)
< 40	1	20,00	20,00
40 – 55	1	20,00	40,00
56 – 75	3	60,00	100,00
> 75	0	0,00	0,00
	5	100,00	-

Based on the table above, the total number of respondents was five (5). One principal (20%) obtained an N-Gain Score < 40, while another principal (20%) obtained a score between 40–55. Furthermore, three principals (60%) obtained scores between 56–75. None of the principals achieved an N-Gain Score > 75 (Appendix 19)

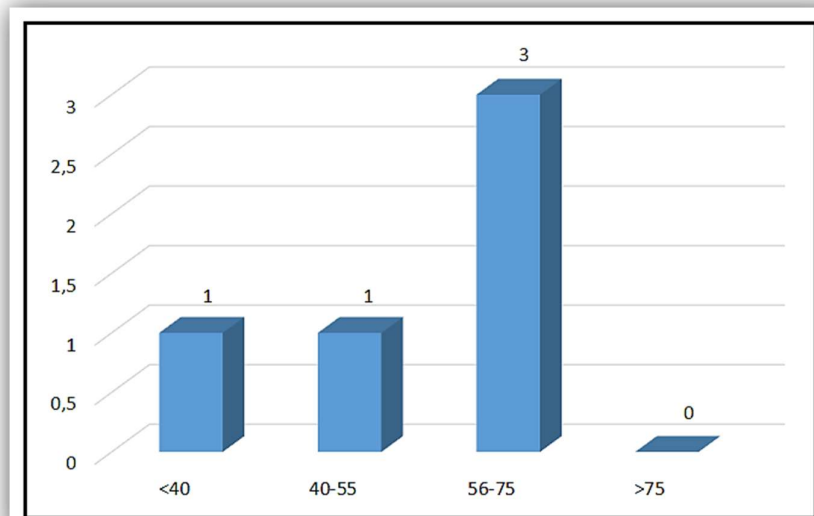


Figure. Bar Chart of N-Gain Scores in the Limited Trial (I)

Table. Distribution of N-Gain Scores in the Extended Trial (II)

Interval	Extended Trial (II)		
	<i>F</i>	Percentage (%)	Cumulative Percentage (%)
< 40	2	13,33	13,33
40 – 55	4	26,67	40,00

56 – 75	7	46,67	86,67
> 75	2	13,33	100,00
	15	100,00	-

Based on the table above, the total number of respondents was fifteen (15). Two principals (13.33%) obtained an N-Gain Score < 40, four principals (26.67%) obtained a score between 40–55, and seven principals (46.67%) obtained scores between 56–75. Furthermore, two principals (13.33%) obtained scores > 75. The distribution of N-Gain Scores in the extended trial is illustrated in the following bar chart.

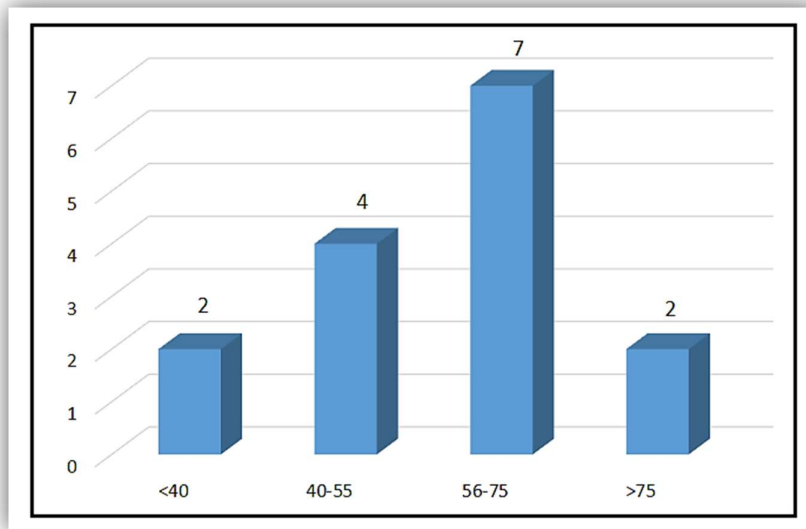


Figure. Bar Chart of N-Gain Scores in the Extended Trial (II)

The distribution of minimum, maximum, and average N-Gain Scores in both the limited trial (I) and the extended trial (II) is presented in the following figure.

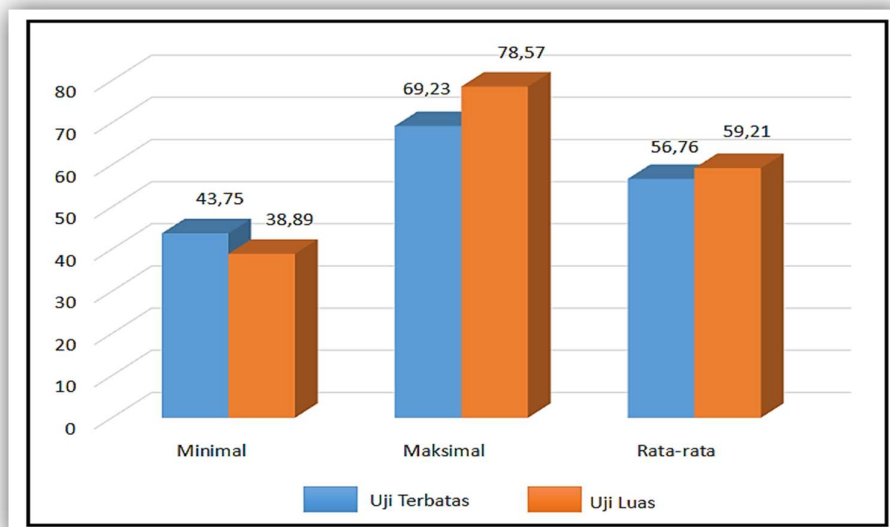


Figure. Graph of N-Gain Scores in Limited Trial (I) and Extended Trial (II)

Based on Figure 4.27, the average N-Gain Scores (g) of the two trials were 56.76% and 59.21%, respectively. Since the values of $g > 55$ fall into the effective category, it can be concluded that the implementation of the web-based mentoring management model for school supervisors is effective in improving the managerial competence of public high school principals in Southeast Aceh Regency. The effectiveness of the web-based mentoring management model was confirmed by both the Paired Sample t-test and the average N-Gain Scores obtained from the two trials. The Sig. (2-tailed) values in both trials were > 0.05 , thus rejecting H_0 and accepting H_a . This indicates a significant difference between the pretest and posttest results, demonstrating that the use of the web-based mentoring management model had a positive effect on improving the managerial competence of public high school principals in Southeast Aceh Regency. Therefore, it is concluded that the implementation of the web-based mentoring management model for school supervisors is effective in enhancing the managerial competence of public high school principals in Southeast Aceh Regency.

Conclusion

This study developed and validated a Web-Based School Supervisor Assistance Management Model designed to enhance the managerial competence of senior high school principals in Aceh Tenggara. The model is characterized by usability, clarity, aesthetics, interactivity, and accessibility through the web, incorporating input, process, and output components aligned with the objectives of school supervision.

The feasibility tests indicated that the model is highly feasible, as evidenced by material expert evaluation (84.76%), media expert evaluation (91.11%), and limited user trials (95.30%), all categorized as highly feasible. Moreover, the effectiveness test showed significant improvement in principals' managerial competence, with the mean score increasing from 59.33% (pretest) to 84.33% (posttest), supported by an N-Gain score of 0.59 and an N-Gain percentage of 59.21, both in the effective category.

Thus, the web-based model is both feasible and effective as an innovative approach to strengthening the role of school supervisors in improving principals' managerial competence.

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