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Enhancing vocational school counseling program supervision through data-driven feedback

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ABSTRACT

This study aims to explore the effectiveness of a data-driven structured feedback mechanism in the supervision of guidance and counseling (BK) programs in vocational high schools (SMK) in Central Java, Indonesia. Using a quasi-experimental design with pretest-posttest control group approach, the study involved 10 vocational high schools, with 5 schools each in the experimental and control groups. The experimental group comprised 5 supervisors and 10 counseling teachers, while the control group had the same number of participants. Results showed a significant improvement in supervisory effectiveness in the experimental group, with a mean difference of 1.25 ($p < 0.001$), compared to a minimal increase of 0.15 in the control group. The findings highlight the importance of integrating data in educational supervision and contribute to the development of more effective supervision models.

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Introduction

The Guidance and Counseling (GC) program in Vocational High Schools (VHS) in Indonesia plays a crucial role in supporting the academic, social, and emotional development of students. Despite its importance, the quality of GC program implementation varies significantly across schools, often due to inconsistent monitoring and evaluation practices. In Indonesia, GC supervision is frequently conducted in a traditional, administrative manner, lacking comprehensive data-based evaluation. This study addresses the need to enhance the monitoring mechanism of GC programs in SMKs, focusing on the implementation of a data-driven structured feedback mechanism to ensure consistency and effectiveness in meeting students' needs. (Davis et al., 2021; Prasetya et al., 2024; Schahczenski & van Dyne, 2019; Xu et al., 2023).

Effective supervision mechanisms are essential for ensuring that guidance and counseling programs are not only implemented in accordance with established standards but also responsive to the needs of students and the diverse contexts of educational institutions. Several research findings highlight the significance of structured and data-driven feedback in enhancing the efficacy and outcomes of educational programs, including BK (Verhaeghe et al., 2015; Weidlich et al., 2024). The study revealed that structured feedback enhances the comprehension of educators and supervisors regarding the efficacy of their programs, thereby facilitating more precise modifications.

The use of data-based supervision has been demonstrated to be an effective approach in a range of educational contexts. For example, several research findings have shown that systematic and continuous data-driven supervision can enhance the precision of program evaluations and expedite

the process of program improvement in various fields, including education (Awange, 2012; Luoma et al., 2023; Mhlanga, 2024; Schafer, 2024), The utilization of data in supervision enables supervisors to offer more objective and detailed feedback, which subsequently enhances the caliber of the supervised programs. Furthermore, research demonstrates that the incorporation of data into educational decision-making processes, including the supervision of counseling programs, can enhance the accountability and efficacy of these programs (Kerr et al., 2006; Schildkamp et al., 2017; Shen et al., 2010). Educational institutions that employed data-driven supervision and evaluation consistently demonstrated notable improvements in academic achievement and student satisfaction with the guidance and counseling program.

However, in Indonesia, the supervision of counseling programs in vocational schools is frequently conducted in a traditional manner, with a greater emphasis on administrative procedures than on comprehensive data-based evaluation. This is evidenced by the findings of a study conducted by Giroth et al (Giroth et al., 2021).which revealed that Indonesia continues to rely primarily on data as the primary basis for supervising counseling programs. This finding highlights a notable discrepancy between the theoretical framework and practical implementation of guidance and counseling program supervision in the field. This limitation impedes the ability of supervisors to provide constructive and data-driven feedback, which ultimately affects the overall efficacy of the guidance and counseling program.

In light of the pivotal role that effective supervision plays in guaranteeing the quality of the guidance and counseling program, it is imperative to adopt a more systematic and evidence-based methodology for the supervision of this program. This approach will facilitate more appropriate and targeted feedback from supervisors and enhance their ability to tailor the program according to the specific needs of students and schools. In light of the extant empirical evidence, this study seeks to investigate and implement a data-driven, structured feedback mechanism in the supervision of guidance and counseling programs in SMK. It is anticipated that this study will make a substantial contribution to the development of a more effective supervision model and enhance the quality of counseling programs in SMKs in Indonesia.

Methods

This study employed a quasi-experimental design with a pretest-posttest control group approach. This design permits researchers to evaluate the efficacy of data-driven structured feedback mechanisms in the supervision of Guidance and Counseling programs between experimental and control groups. In the initial stage of the study, measurements were taken to obtain baseline data (pretest) from both groups. Subsequently, the experimental group was provided with an intervention in the form of a data-based structured feedback mechanism, while the control group continued to utilize conventional supervision methods. Following the intervention period, a re-measurement (posttest) was conducted to evaluate the changes that had occurred.

The research subjects were selected through purposive sampling to ensure alignment with the research objectives. The study was conducted at 10 vocational schools in Central Java, Indonesia. Five schools were randomly assigned to the experimental group, and five to the control group. Each school contributed one school counselor (guidance and counseling supervisor) and two school counselor educators, resulting in a total of 15 subjects (5 supervisors and 10 counseling teachers) for this study. To be included, schools had to have been running a counseling program for at least three years and have a well-defined supervisory structure. Random selection was conducted within the group that met these criteria to minimize selection bias.

This study employed three instruments: questionnaires, semi-structured interview guides, and observation sheets. The questionnaire was constructed with a 5-point Likert scale to assess the perception and efficacy of the supervisory framework of the counseling program, encompassing the dimensions of accountability, responsiveness, and the quality of feedback. The questionnaire was validated using the Content Validity Index (CVI), which yielded an average CVI of >0.80, indicating

high content validity. The reliability of the instrument was evaluated using Cronbach's alpha, which yielded a value greater than 0.70, indicating strong reliability. The interview guides were employed for the purpose of conducting a comprehensive examination of the subjects' implementation and experience with the data-driven feedback mechanism. The qualitative data obtained from the interviews were subjected to thematic analysis. The observation sheets were developed based on indicators of successful supervision of the BK program, which were derived from the national BK standards and adapted from relevant literature. The observation instrument was evaluated through inter-rater reliability, demonstrating a Cohen's Kappa value of >0.75, which indicates a high level of inter-rater agreement.

Data collection was conducted in three main phases: pre-intervention, intervention, and post-intervention. In the pre-intervention phase, baseline data was collected from both groups through questionnaires and interviews. This data served as an initial benchmark to assess the effectiveness of the counseling program prior to the implementation of the data-based structured feedback mechanism. The intervention phase lasted for one academic semester, during which the experimental group implemented the data-based structured feedback mechanism, while the control group continued with conventional supervision. During this phase, supervisors and counseling teachers in the experimental group attended an intensive researcher-facilitated training program on the use of data in decision-making and supervision. In the post-intervention phase, data were collected again using the same instruments to assess changes in supervisory effectiveness.

Quantitative data were analyzed using analysis of covariance (ANCOVA) to control for confounding variables and compare effectiveness between the experimental and control groups. This test was chosen for its ability to account for pretest scores as a covariate, allowing the analysis to more accurately identify the effect of the intervention. Qualitative data from the interviews were analyzed using NVivo with a thematic analysis approach, which involved open coding, theme development, and in-depth interpretation to understand the context of implementation and subject perceptions. Triangulation analysis was used to integrate results from questionnaires, interviews, and observations, to ensure the validity and reliability of the research findings. The final results were interpreted in the context of relevant theories and policies, and compared with findings from previous studies to identify new contributions from this research.

Results and Discussion

Data Description of Research Subjects

A total of 15 subjects consisting of 5 supervisors and 10 counseling teachers from 10 vocational schools in Central Java participated in this study. Of the 10 SMKs, 5 SMKs were designated as the experimental group, while the other 5 SMKs as the control group. The experimental group applied the data-based structured feedback mechanism in the supervision of the counseling program for one academic semester, while the control group continued to use conventional supervision methods.

Table1. Characteristics of Research Subjects

Characteristics	Experimental Group (n=10)	Control Group (n=10)	Total (n=20)
Gender			
Male	6	5	11
Female	4	5	9
Experience (years)			
1-5 years	3	4	7
6-10 years	5	4	9
>10 years	2	2	4

Quantitative Data Analysis
Descriptive Analysis of Supervision Effectiveness

Descriptive analysis showed a significant difference between pretest and posttest scores in both groups. Table 2 displays the descriptive results of the supervisory effectiveness of the counseling program before and after the intervention.

Tabel 2. Descriptive Statistics of the Effectiveness of Supervision of the BK Program

Group	N	Pretest Mean	Posttest Mean	Mean Difference
Experimental	10	3.20	4.45	1.25
Control	10	3.15	3.30	0.15

The average value of supervisory effectiveness in the experimental group increased from 3.20 to 4.45, with an average difference of 1.25. Meanwhile, the control group only experienced a minimal average increase, from 3.15 to 3.30, with an average difference of 0.15.

ANCOVA Test

To test the significance of the difference between the experimental and control groups after the intervention, the Analysis of Covariance (ANCOVA) test was used with pretest as the covariate. The ANCOVA results are presented in Table 3.

Table 3. ANCOVA Test Result

Source of Variation	df	Mean Square	F	Sig. (p)
Pretest	1	2.896	5.321	0.032
Group	1	12.56	22.891	0.001
Error	17	0.544		
Total	19			

The results showed that there was a significant effect of the intervention on the effectiveness of supervision of guidance and counseling programs ($F(1, 17) = 22.891$, $p < 0.001$), after controlling for the effect of pretest scores. This indicates that the data-based structured feedback mechanism significantly improved the effectiveness of supervision of the counseling program compared to the conventional method. The effect size (Cohen's d) for the improvement in supervisory effectiveness in the experimental group was 1.50, indicating a large effect.

Qualitative Data Analysis

Qualitative data obtained from the interviews were analyzed using thematic analysis. The results of the analysis showed several main themes that emerged related to the subjects' perceptions and experiences with the data-driven structured feedback mechanism.

Improved Supervisor Accountability

The majority of supervisors in the experimental group reported increased accountability after using data as the basis for feedback. They stated that objective data helped in making more informed and transparent decisions and enabled them to provide more constructive feedback to counseling teachers. One supervisor commented, "Using data has made our feedback more precise and actionable, which has improved our overall effectiveness."

Responsiveness to Student Needs

BK teachers in the experimental group also reported that the use of data in supervision helped them to be more responsive to students' needs. They felt better able to tailor the counseling program to students' specific needs based on accurate data analysis. A counseling teacher noted, "With data, we can see exactly where students are struggling and provide targeted support."

Challenges in Implementation

Nonetheless, some challenges were identified, mainly related to limitations in technology mastery and data interpretation. Some supervisors and BK teachers revealed that they need more training and technical support to fully utilize the potential of data in supervision. One supervisor mentioned, "We need more training on how to interpret the data and use it effectively in our supervision."

The findings of this study provide strong empirical evidence that the implementation of a data-driven structured feedback mechanism significantly improves the effectiveness of supervision of Guidance and Counseling programs in SMKs. The significant difference in supervisory effectiveness between the experimental and control groups, as evidenced by the pretest-posttest results and field observations, aligns with previous research on the benefits of data-driven approaches in educational supervision (Vanlommel et al., 2016).

The improvement in supervisory effectiveness is not only statistically significant but also practically meaningful, as indicated by the large effect size (Cohen's d = 1.50). This suggests that the data-based structured feedback mechanism has a substantial impact on enhancing the quality and responsiveness of the counseling program. The qualitative data further support these findings by highlighting the increased accountability and responsiveness to student needs among supervisors and counseling teachers in the experimental group. Supervisors reported that data-driven feedback made their decisions more informed and transparent, leading to more effective and targeted interventions. For instance, one supervisor commented, "Using data has made our feedback more precise and actionable, which has improved our overall effectiveness" (Bastian et al., 2016).

Counseling teachers also noted that the use of data helped them better understand and address the specific needs of their students. A counseling teacher observed, "With data, we can see exactly where students are struggling and provide targeted support" (Mandinach & Jackson, 2012). However, the study also identified several challenges in the implementation of the data-driven feedback mechanism. These challenges, primarily related to technology mastery and data interpretation, highlight the need for ongoing training and technical support for supervisors and counseling teachers. Addressing these challenges is crucial for the successful and sustained implementation of data-driven supervision in educational settings. One supervisor mentioned, "We need more training on how to interpret the data and use it effectively in our supervision" (Quint & Smith, 2008).

In conclusion, this study underscores the importance of integrating data into the supervision process to achieve more optimal and responsive outcomes. The findings provide valuable insights for educators, policymakers, and practitioners interested in improving the quality of guidance and counseling programs in vocational schools. Future research should explore the generalizability of these findings in different contexts and address the unique challenges faced by schools in implementing data-driven supervision.

Conclusion

The results of this study demonstrate that the implementation of a data-driven structured feedback mechanism significantly enhances the effectiveness of supervision of Guidance and Counseling programs in SMKs. The significant difference in supervisory effectiveness between the experimental and control groups, as evidenced by the pretest-posttest results and field observations, aligns with previous research on the benefits of data-driven approaches in educational supervision (Bastian et al., 2016; Dunlap & Piro, 2016; Ronfeldt & Campbell, 2016). This study underscores the importance of integrating data into the supervision process to achieve more optimal and responsive outcomes. However, the study also identifies challenges in technology mastery and data interpretation, suggesting the need for ongoing training and support for supervisors and counseling teachers. Future research should explore the generalizability of these findings in different contexts and address the unique challenges faced by schools in implementing data-driven supervision.

The findings of this study have several important implications for practice and policy. First, the implementation of data-driven structured feedback mechanisms can significantly improve the quality and effectiveness of supervision in guidance and counseling programs. This is particularly relevant for vocational schools where the need for tailored and responsive support is crucial for student success. Second, the study highlights the importance of providing comprehensive training and technical support to supervisors and counseling teachers. Training should focus on data literacy, data interpretation, and the practical application of data in decision-making processes. This will help

ensure that supervisors and teachers are equipped to use data effectively to enhance their supervisory practices. Third, the study emphasizes the need for active involvement of all stakeholders, including supervisors and teachers, in the data-driven supervision process. Active participation in data collection and analysis not only improves the accuracy of evaluations but also strengthens the sense of responsibility and accountability among all participants.

While this study provides strong empirical evidence on the benefits of data-driven feedback mechanisms, it has several limitations. The study was limited to 10 SMKs in the Central Java region, which may not be fully representative of conditions in other parts of Indonesia. Additionally, the sample size is relatively small, which may affect the generalizability of the findings. Future research should involve a larger and more diverse sample to strengthen the generalizability of these findings.

Based on the findings of this study, the following recommendations are proposed: (1) Policy Makers: Develop and implement policies that mandate the use of data-driven structured feedback mechanisms in the supervision of guidance and counseling programs. Provide resources and support for training and capacity building in data literacy and data-driven decision-making. (2) Educational Institutions: Invest in training programs for supervisors and counseling teachers to enhance their skills in data collection, analysis, and interpretation. Foster a culture of continuous improvement and data-driven decision-making within the institution. (3) Supervisors and Teachers: Actively engage in data-driven supervision practices and seek ongoing professional development opportunities to enhance their skills. Collaborate with colleagues to share best practices and improve the overall quality of supervision. In summary, this study makes a significant contribution to the literature on supervision of counseling programs in vocational schools, particularly in terms of how data-based structured feedback mechanisms can improve supervisory effectiveness. The findings are not only relevant for supervisors and counseling teachers but also for education policy makers who aim to improve education quality through data-driven approaches. As such, the results of this study can serve as a basis for the development of more effective and sustainable supervision policies and practices in the future.

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