

## Implementing the GROW Coaching Model in Developing Competencies of Educators: A Meta-Analysis

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### ABSTRACT

*The GROW coaching model has gained attention in educational contexts, yet empirical evidence regarding its effectiveness remains varied. Differences in research designs, performance indicators, and implementation have produced fragmented findings, making it difficult to obtain a consistent understanding of the model's impact. This study aims to analyze this gap through meta-analysis. A total of 22 empirical studies were analyzed using a random-effects model, supplemented with heterogeneity tests, forest plot analysis, effect size calculations, and publication bias identification. The meta-analysis yielded a pooled effect size of 0.43, indicating a moderate level of effectiveness with no evidence of publication bias. These findings demonstrate that the GROW model consistently contributes to the development of multiple domains of educator competence, including managerial skills, supervisory abilities, and teaching and learning practices. Overall, the results affirm that the GROW model reliably supports educator competency development, although its effectiveness remains shaped by contextual factors.*

### Keywords:

GROW Coaching Model; Meta-Analysis; Teacher Competence; Principal Competence; Professional Development.

### ABSTRAK

*Model pelatihan GROW telah menarik perhatian dalam konteks pendidikan, namun bukti empiris mengenai efektivitasnya masih bervariasi. Perbedaan dalam desain penelitian, indikator kinerja, dan implementasi telah*

*menghasilkan temuan yang terfragmentasi, sehingga sulit untuk memperoleh pemahaman yang konsisten tentang dampak model tersebut. Studi ini bertujuan untuk menganalisis kesenjangan ini melalui meta-analisis. Sebanyak 22 studi empiris dianalisis menggunakan model efek acak, dilengkapi dengan uji heterogenitas, analisis plot hutan, perhitungan ukuran efek, dan identifikasi bias publikasi. Meta-analisis menghasilkan ukuran efek gabungan sebesar 0,43, menunjukkan tingkat efektivitas yang moderat tanpa bukti bias publikasi. Temuan ini menunjukkan bahwa model GROW secara konsisten berkontribusi pada pengembangan berbagai domain kompetensi pendidik, termasuk keterampilan manajerial, kemampuan pengawasan, dan praktik pengajaran dan pembelajaran. Secara keseluruhan, hasil penelitian menegaskan bahwa model GROW secara andal mendukung pengembangan kompetensi pendidik, meskipun efektivitasnya masih dipengaruhi oleh faktor kontekstual.*

**Kata kunci:**

Model Coaching GROW; Meta-Analisis; Kompetensi Guru; Kompetensi Kepala Sekolah; Pengembangan Profesional.

## 1. Introduction

Coaching has increasingly been recognized as a strategic approach to enhance professional capacity within educational settings. As educational systems across the globe face rapid advancements in technology, evolving student needs, and growing expectations for high-quality instruction, educators are required to develop and adapt their competencies continuously (Campbell & Mogashana, 2025; Saunders et al., 2024). These demands underscore the importance of structured, evidence-based professional development aligned with the needs of teachers and school leaders. In this context, coaching emerges as an effective method for fostering reflective practice, improving performance, and cultivating professional growth. The success of coaching relies on well-structured stages that ensure effectiveness and efficiency in facilitating growth. In the education sector, the demand for structured coaching approaches has become even more critical amid rapidly evolving expectations for educators' professional competencies.

One of the most widely recognized coaching models is the GROW Model, introduced by Whitmore (2009). This model has been adopted across diverse sectors, including education, to support the professional development of teachers and school principals. The model is built on four interconnected stages: Goal, Reality, Options, and Will, which guide individuals through structured reflection and actionable planning. By enabling educators to clarify goals, analyze existing challenges, explore possible strategies, and commit to concrete actions, the GROW Model promotes systematic improvement in both teaching and leadership practices. Several studies have reported positive outcomes from its implementation. In educational contexts, the implementation of the GROW Model has demonstrated significant benefits. Research indicates that coaching using the GROW framework effectively strengthens managerial competence (Balang et al., 2019; Isnawan & Sudirman, 2022),

enhances teaching and learning processes (Rahman, 2023), and improves supervisory practices that contribute to school effectiveness (Slam, 2020). Additionally, coaching has been shown to foster reflective thinking, improve decision-making, and support educators in addressing instructional and administrative challenges (Bandur, 2012; Donkoh et al., 2023). These findings suggest that GROW-based coaching has considerable potential to systematically and sustainably enhance educator performance.

Although the number of studies on the GROW coaching model is growing, empirical findings remain inconsistent. Existing research varies widely in research design, measurement indicators, implementation context, and sample size, most notably because many Indonesian studies rely heavily on small-scale action research. This inconsistency makes it difficult to draw firm conclusions about the overall effectiveness of the GROW model across educational settings. These variations also suggest that contextual factors may influence the extent to which the GROW model affects educator competencies. In many cases, previous studies include short-term interventions, samples of fewer than 30 participants, or limited evaluation metrics, which further restrict the generalizability of their results.

The need to strengthen educators' competencies is particularly important because teachers and principals serve as key agents shaping student learning. Education is a core factor in shaping human personality (Brauckmann et al., 2023; Lisnasari et al., 2023). Fazal et al. (2020) argue that education is also a means to improve the quality of human resources. This condition states that education is created through interactions carried out by all educational elements, consisting of the school's principals, teachers, students, learning curricula, and subjects that support learning (Purnasari & Sadewo, 2021; Reddy et al., 2017; Ridwan et al., 2021; Saputro & Mahmudi, 2020). To effectively fulfill their roles, educators require up-to-date competencies, which can only be achieved through coaching and training. This condition requires continuous renewal and strengthening of competencies. Such improvement processes demand appropriate training designs, as enhanced educational quality can only be achieved if all actors possess strong competencies. School principals, therefore, play a central role in advancing educational programs, and human resource capacity must be strengthened as a key force (Abadi, Sutipto & Hanafi, 2021; Anand et al., 2023; Lee et al., 2021; Nasution et al., 2022; Vally & Daud, 2015; Yunusalievich, 2022).

Several educational management problems concern the use and management of existing resources (Bandur, 2012; Donkoh et al., 2023; Eustachio et al., 2024; Moradi et al., 2012; Russo et al., 2023). These problems often trigger low-quality education in schools; therefore, they must be addressed (Joseph et al., 2020). This issue can be mitigated when schools implement effective planning, implementation, and evaluation processes. Research suggests that through targeted training, school principals can develop leadership abilities and managerial skills (Augestad et al., 2020; Baker & Bloom, 2017; Beattie et al., 2014; Okorie et al., 2022; Sahlberg & Stringer, 2023; Thessin & Reyes, 2023; West, 2017). One type of coaching model that has proven to be impactful is GROW (Eriksen et al., 2020; Guedes & Alexandre, 2021; Musta'in et al., 2020; Okorie et al., 2022; Thipatdee, 2019) and GROW ME (Hanif et al., 2020; Kurniady & Komariah, 2019). The effectiveness of these models

in improving managerial and target competencies supports the need for a deeper understanding of their overall impact.

Despite encouraging findings, empirical research on the effectiveness of the GROW model remains fragmented, varies widely in methodological rigor, and lacks systematic integration. Many training and coaching programs are still lecture-based, short-term, and disconnected from classroom realities, making it difficult for educators to implement sustained practice. This gap underscores the need for a robust synthesis of empirical evidence. While multiple studies have explored the GROW model across different educational settings, there remains a lack of systematic integration that evaluates cumulative effectiveness, identifies research patterns, and assesses inconsistencies or biases. A meta-analysis provides a rigorous approach to address this gap by quantifying overall effect sizes, examining heterogeneity, and detecting publication bias.

Therefore, this study aims to analyze the effectiveness of the GROW Coaching Model in developing educators' competencies through a comprehensive meta-analysis of empirical studies conducted between 2018 and 2023. Specifically, this study synthesizes effect sizes across research, identifies moderator influences, evaluates heterogeneity, and examines potential publication bias to ensure the robustness and reliability of the findings.

## 2. Methods

### 2.1 Research Design

This study used a meta-analysis of published articles that accurately describe the implementation of the GROW Coaching Model in education. This meta-analysis was implemented to evaluate and combine the data from several research articles to identify and analyze concepts and hypotheses from research results (Borenstein et al., 2009; Lipsey & Wilson, 2001). The stages of this meta-analysis study consisted of identifying relevant research, classifying articles according to the topic, calculating effect sizes, having statistical analysis such as effect sizes, and evaluating research studies (Höffler & Leutner, 2007). This meta-analysis is intended to identify the implementation of the GROW coaching model in education. This meta-analysis focused on the effectiveness of implementing the GROW coaching model in developing the managerial skills of school principals in Indonesian elementary schools.

### 2.2 Population and Sample

The sample for this meta-analysis consisted of research articles obtained from open-access sources such as Google Scholar, SINTA, and GARUDA, using the keywords "the effectiveness", "implementing the GROW Coaching Model in education", or "coaching the GROW Model implementation in Indonesia". Research articles were selected based on independent variables, including experimental and control classes, related to the implementation of the GROW coaching model in education in Indonesia. Identification was conducted according to the research type, namely

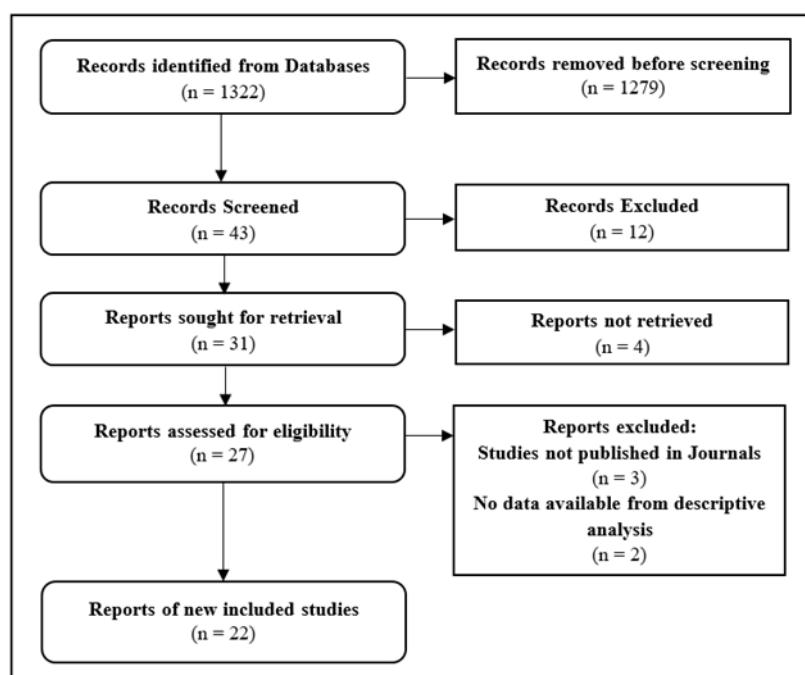
a quasi-experimental study, which included descriptive statistical analysis results that accounted for the standard deviation, sample size, and mean score.

### 2.3 Instruments

The Data used in this meta-analysis consisted of descriptive analysis results extracted from each article. Articles were then coded based on author, publication year, research focus, and other key variables required for meta-analysis synthesis.

### 2.4 Data Collection Procedure

The criteria for this meta-analysis were determined using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) stages presented in Picture 1 (Moher et al., 2009).



**Picture 1.** PRISMA Diagram – The Flowchart of the Meta-Analysis Search Process

Picture 1 shows that the article exploration process used in the meta-analysis included several stages: identification, screening, and final search results. At the identification stage, the article search process used an open-access website with predetermined keywords according to the research topic. Based on the identification results, data screening was conducted to identify research data suitable for the study and analysis.

### 2.5 Data Analysis Techniques

The descriptive data analysis results were then coded and grouped by author and research year. The final stage involved conducting a meta-analysis using the 'moderate' variable and a descriptive analysis of the study results. Thus, it was in line with the qualification of heterogeneity test criteria,

funnel plot, forest plot, effect size calculation, and publication bias. The data analysis for this meta-analysis used funnel and forest plots, which utilized the Trim and Fill approach. The effectiveness of coaching in implementing the GROW model to develop school principals' managerial abilities was analyzed using a forest plot. The coefficients of the effect size criteria used in this meta-analysis consisted of 0.00-0.20: weak; 0.21-0.50: small; 0.51-1.00: medium; and greater than 1.01: large (Cohen et al., 2018). The effectiveness of implementing the GROW coaching model in developing the managerial abilities of school principals can be seen from the rejection of the hypothesis with an estimated z score less than 0.05, and the number for the size effect was 0 (Retnawati et al., 2018). The heterogeneity test was established if the fixed-effect model was used. It used parameters  $I^2$  for the heterogeneity (Lipsey & Wilson, 2001; Retnawati et al., 2018). The analysis of the funnel plot was aimed to determine the publication bias of the articles that would be studied by using the Trim and Fill approach (Card, 2012). In the important case, the meta-analysis results did not have publication bias, so the funnel plot was stated to be symmetrical (Borenstein et al., 2009; Cooper, 2016).

**Table 1.** Source Identity

Author	Year	Country/ Region	Method	Research Focus	Source
Abu Nawas	2023	Indonesia	Descriptive Qualitative Research	Improving teacher competence through the GROW or GROW-ME coaching model involves implementing structured coaching actions and assessing competency changes before and after the intervention	Jurnal Perspektif Pendidikan dan Keguruan
Wan Norhasma Wan Hasnan and Nurahimah Mohh Yusoff	2019	Malaysia	Survey- Research Design	Instructional Coaching for Secondary School Principals	Journal of Educational Research and Indigenous Studies
Moch. Mustain, Arif Rahman, and Restu Jokky and Julia Surya	2020	Indonesia	Action Research	The application of academic supervision by applying the Coaching Grow Model to improve the competence of vocational school teachers.	Advances in Social Science, Education, and Humanities Research
Jokky and Julia Surya	2022	Indonesia	Action Research	Strategies for developing communication skills in an educational context	International Journal of Educational Management and Innovation
David R. Anthony, Sandy Gordon, Daniel F.	2017	Not Mentioned	Literature Review	Application of the coaching GROW model for the development of mental toughness of sports practitioners	Journal of Sport Psychology in Action

Gucciardi, and Brian Dawson Jordan A. Martenstyn & Anthony M. Grant (Martenstyn & Grant, 2022)	2021	Australia	Quantitative Research	Mental contrast online comparative effectiveness trial with implementation intent (MCII) versus solution- focused training questions (SFC) – Undergraduates at the University of Sydney	Coaching: An International Journal of Theory, Research and Practice
Muhamad Galang Isnawan and Sudirman Sudirman Gaochagorn Thipatdee	2022	Indonesia	Qualitative Research	Principal development with coaching methods	Tarbawi: Jurnal Keilmuan Manajemen Pendidikan
Suyoto & Egar Ngasbun Zaenul Slam	2019	Thailand	Quantitative Research	Coaching and Mentoring Skills Development based on the coaching grow model for prospective teachers in Thailand	Journal of Education and Learning
Suyoto & Egar Ngasbun Zaenul Slam	2019	Not Mentioned	Action Research	Classroom Action Research Assessment Assistance	European Journal of Humanities and Social Sciences
Endang Susilawati	2020	Indonesia	Action Research	Application of the GROW model for the development of Child-Friendly Schools	JMIE: Journal of Madrasah Ibtidaiyah Education
Taufik Rahman	2018	Indonesia	Action Research	Coaching and monitoring educational partnership activities using the GROW-ME model supervision method	Jurnal Pendidikan Cermin Profesionalitas
Murni	2021	Indonesia	Action Research	Quality assurance of teaching and learning activities with character in target schools, with collaboration in the preparation of learning media through the GROW-ME approach	JULAK: Jurnal Pembelajaran dan Pendidikan
Muslikin, Makrina Tindangen, and Afif Ruchaemi M. Amir, Pangkat Siburian, Abdul	2018	Indonesia	Action Research	Teachers' ability to motivate students in learning through the GROW ME model coaching approach	Borneo: Jurnal Ilmu Pendidikan
Muslikin, Makrina Tindangen, and Afif Ruchaemi M. Amir, Pangkat Siburian, Abdul	2021	Indonesia	Action Research	Improving the performance of science teachers in implementing process standards through Peer Coaching	Edukasia: Jurnal Pendidikan dan Pembelajaran
M. Amir, Pangkat Siburian, Abdul	2015	Indonesia	Action Research	Academic supervision of GROW ME training techniques to improve the ability of English teachers to	Jurnal Kependidikan dan Kepengawasan

Muin Sibuea Lekseni Soya	2020	Indonesia	Action Research	apply the STAD-type cooperative model Teachers' Ability to Manage Remedial Teaching in Science Subject Groups through Peer Coaching	Journal of Education of Batanghari
Ardiana Arifin	2020	Indonesia	Action Research	The performance of science teachers in determining the minimum achievement criteria score	Jurnal Binomial
Suraiman, 2021	2021	Indonesia	Action Research	Improvement of Teacher Competence in HOTS-based Learning	Jurnal Pendidikan Tambusai
Abdul Rahmat and Mirnawati	2021	Not Mentioned	Qualitative Descriptive	Application of the coaching model grows through knowledge andragogical content learning	Digital Press Social Sciences and Humanities
Asnia Kadir Kadir, Gunasegarana, Karuppanna, Mohammad Abdur Rahman, Mokana Muthu Kumarasamy	2021	Malaysia	Descriptive Survey	Relationship between training and metacognition knowledge building of Bahasa Malaysia teachers	American International Journal of Education and Linguistics Research
Nick Burnett	2017	Not Mentioned	Book Review	Implementation of E-Coaching	Coaching: An International Journal of Theory, Research and Practice
Ozgun Ozmen	2019	Turkey	Survey	Scale Development Study to Measure Secondary School Teachers' Opinions on Coaching Behavior	Eurasian Journal of Educational Research

### 3. Results and Discussion

#### 3.1 Descriptive Characteristics of Included Studies

The review identified 22 empirical studies that met the inclusion criteria: five articles published in reputable international journals, 14 in SINTA-indexed national journals, and 3 in international conference proceedings. Rather than merely summarizing publication outlets, this distribution reveals a structural pattern in the GROW coaching research landscape. Specifically, the dominance of national publications indicates that the application of the GROW model in Indonesia is primarily practice-oriented and operationalized within local school improvement initiatives. In contrast,

international publications tend to situate GROW within broader theoretical or methodological discourses. Descriptively, each study contributed information on means, sample sizes, and standard deviations, which were used as inputs for meta-analytic computations across the moderator variables. Compared with previous literature reviews that primarily cataloged coaching models, the present meta-analysis provides a quantitative synthesis that systematically evaluates the magnitude of GROW’s effectiveness across diverse school contexts, levels of educator experience, and sample-size groupings. This comparative advantage demonstrates that the evidence base supporting GROW in Indonesia is substantial in volume but uneven in methodological rigor, with national studies generally employing a small-sample action-research design. In contrast, international studies more frequently adopt an experimental or quasi-experimental framework.

*3.2 Heterogeneity and Comparative Interpretation*

The initial analysis stage involved conducting a test of heterogeneity to identify the research sample's published variability. Identification of this variability was used to estimate the effect sizes based on sampling errors. The heterogeneity test in this meta-analysis used the Q statistic, with the p-value shown in Table 2.

**Table 2.** Result of Heterogeneity Test Analysis

Moderator Variable		Q-Statistic		
		Value	df	p-value
Office Term	1-5 Years	27.05	12	0.0032
Sample Size	1-20	27.09	10	0.0005

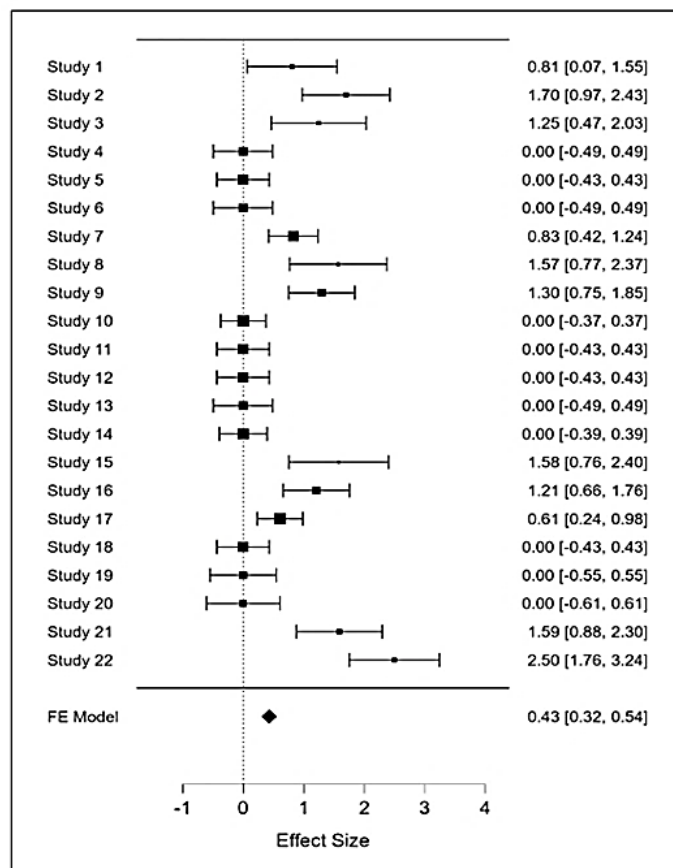
Table 2 presents the results of the heterogeneity test for research articles on the implementation of the coaching GROW mode to develop the competencies of school principals and teachers. The test was conducted in both the control and experimental classes. The heterogeneity analysis used Q-Statistic values for the moderator variable tenure (1-5 years) and a sample size of 1-20 educators; both yielded  $Q > df$  values with p-values of 0.0032 and 0.0005, each of which is smaller than 0.05. This indicated that the sample data met heterogeneous conditions, so that the effect size was defined by population variance and sampling error. Nevertheless, the research data met the assumption of homogeneity, which was affected only by sampling error. Table 2 stated that the heterogeneity results were obtained for the 1–5-year tenure variable, and the sample size of 1-20 school educators fulfilled the heterogeneity assumption.

These findings imply a variation in implementation outcomes across studies, enabling the analysis to explore moderators rather than merely describing values. In contrast, moderator categories outside this range showed non-significant Q-values, suggesting relative homogeneity. Analytically, this heterogeneity pattern suggests that the effectiveness of the GROW coaching model differs depending on specific educator characteristics and study design parameters. From a comparative perspective, the observed heterogeneity justifies the use of a random-effects model for moderator categories with significant variability, allowing the analysis to account for true differences in population effects rather than attributing them solely to sampling error. Conversely, categories that meet homogeneity assumptions can be modeled using a fixed-effect approach, yielding more stable,

narrowly defined estimates. Overall, the heterogeneity result do not merely validate statistical procedures; they reveal underlying differences in how the GROW coaching model is implemented, experienced, and evaluated across diverse Indonesia school settings. This heterogeneity enables the subsequent sections to discuss effect sizes comparatively rather than descriptively, highlighting which conditions amplify or diminish the model’s impact.

3.3 Random-Fixed-Model Selection and Effect Size Interpretation

Model selection was determined based on the degree of heterogeneity across studies. If the data distribution meets the heterogeneous assumptions, then it uses the random effects model; otherwise. Based on Table 2, the moderator variable (tenure: 1-5 years) and the sample size (1-20 educators) met the assumption of heterogeneity. Therefore, to determine the effect size for each moderator variable, a random-effects model was employed. In other conditions, other moderating variables used fixed-effect models for further analysis, as indicated by the forest plot. The forest plot described how the GROW coaching model affected educators' competencies. The components of this forest included researcher information, the study year, lower effect sizes, and upper bounds for each research study. Forest plot analysis also provides information on the weight of each summary effect and its effect size. The forest-plot summary enabled comparative insight, highlighting which research settings yielded stronger competency improvement and which demonstrated modest gains. This forest plot analysis was carried out using the JASP application shown in Picture 2.



Picture 2. Forest Plot Analysis

Picture 2 presents the forest plot results from an effects-random model, showing effect sizes. The effect size indicated the extent to which the GROW coaching model was effective in developing educators' competencies, including managerial, supervisory, and teaching and learning skills. The effect size plot for each research displayed an effect size score greater than zero. The coaching GROW model implemented proved effective in developing educators' competencies. The summary measure of the GROW model's implementation effectiveness for the tenure (1-5 years) moderator is 0.43 [0.32, 0.54], indicating a medium effect. This numerical outcome serves as the study's central statistical result and provides the basis for subsequent theoretical interpretation in the discussion section.

The GROW Coaching Model demonstrates robust, practically meaningful effects, indicating that structured coaching improves educators' managerial, supervisory, and pedagogical competencies. Compared with other capacity-building interventions, this magnitude places GROW within the range of moderately impactful interventions, indicating that, while beneficial, it may work optimally alongside other developmental programs rather than in isolation.

The forest plot results can also be used to identify differences in the GROW coaching model's effectiveness in implementing other models for developing educators' competencies. This difference in effectiveness was measured using an estimated value calculated from the summary effect size. It was also measured based on the z-value and the p-value. The estimated calculation analysis results are shown in Table 3.

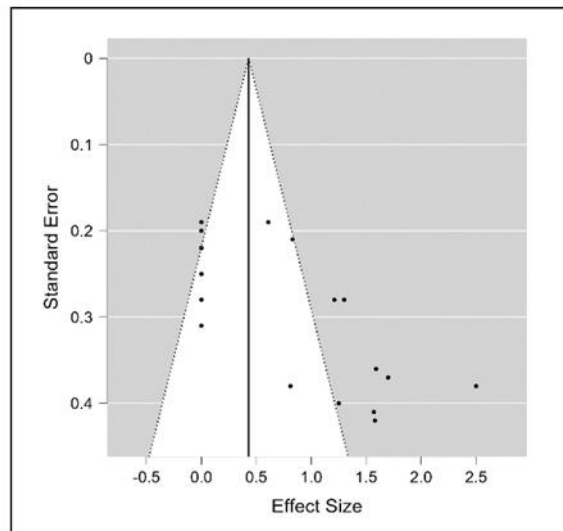
**Table 3.** Result of the Calculation Analysis on the Estimated Value of the Summary Effect Size

<b>Moderator Variable</b>	<b>Estimated-Value</b>	<b>95%-CI</b>	<b>Standard Error</b>	<b>z-value</b>	<b>p-value</b>
Office Term 1-5 years	0.92	[0.70; 1.14]	0.11	8.12	< 0.0001*
Sample Size 1-20	0.81	[0.78; 1.08]	0.16	12.20	< 0.0001*

Table 3 shows the summary effect size for the moderator variable, which used the coaching GROW model. Each school principal had a tenure of 1-5 years, and 1-20 were sampled using the fixed-effect and random-effect models. According to the p-value, the data yield  $p < 0.001$ , so  $H_0$  is rejected. These results indicated significant differences in the effectiveness of developing several competencies among educators when using the GROW coaching model versus not using it. Based on Table 3, other results also showed that the estimated summary effect value for each moderator variable does not include a zero value at the 95% confidence interval. These results indicated that applying the coaching GROW model significantly enhanced educators' competencies. These statistical contrasts reinforce the claim that GROW does not merely correlate with competency growth but contributes to it in measurable and consistent ways. Its effects remain robust across different study conditions. This consistency adds weight to its positioning as a viable coaching framework within Indonesian educational settings.

### 3.4 Publication-Bias Verification

The next stage was to identify publication bias. Publication bias is used to determine the possibility of finding results that are incapable of being statistically significant but are not in accordance with general theory construction. Publication bias was demonstrated using the Trim and Fill model, the regression method, and rank correlation. The funnel plot analysis results in this meta-analysis are shown in Picture 3.



**Picture 3.** Result Of Funnel Plot Analysis

Picture 3 stated that the funnel plot results were identified using effect-size calculations and standard errors for the GROW coaching model in developing educators' competencies. Publication can be described using a visual analysis that shows the distribution of effect sizes within or outside the pyramid funnel plot. If the results of a research study lie outside the pyramid, then the effect sizes were distributed toward the middle and the top.

In this analysis, the funnel plot showed a relatively even distribution of effect sizes around the central vertical line, suggesting no systematic omission of small or non-significant studies. The visual symmetry, therefore, provides initial evidence against publication bias. Both methods were discharged using p-values, which show asymmetric funnel plots, indicating that the samples used in the research study do not indicate publication bias. The regression and rank correlation results were analyzed using JASP, as shown in Table 4.

**Table 4.** Result of Regression and Rank Correlation Method

Moderator Variable		Regression Method		Rank Correlation Method	
		Coefficient Regression	p-value	Coefficient Correlation	p-value
Office Term	1-5 years	-0.890	0.372	-0.035	0.719
Sample Size	1-20	-1.040	0.944	-0.200	0.289

Table 4 identified biased publications in the research on the development of managerial abilities among school principals. The regression coefficient results showed that the coaching GROW model application in developing several competencies of educators with 1-5 years of service, with a research sample of 1-20 educators, yielded -0.890 and -1.040, respectively. The correlation coefficient results obtained from Table 3 are -0.035 and -0.200, respectively. These results showed that the regression and correlation coefficients were negative. Therefore, it can be concluded that the research studies used in this meta-analysis employed predominantly small sample sizes. Based on the analysis in Table 4, the p-value from the rank correlation and regression method is greater than 0.05. The research results used in this meta-analysis were not biased. Overall, the convergence of visual symmetry, non-significant regression slopes, and minimal rank correlations indicates that the meta-analysis is not meaningfully affected by publication bias. As such, the synthesized effect sizes are likely to accurately reflect the underlying body of research, thereby strengthening the interpretive validity of the meta-analytic conclusions.

### 3.5 Discussion

There is still relatively little meta-analysis examining the effectiveness of implementing the coaching GROW model in developing several competencies among school educators. This meta-analysis examined research articles published from 2018 to 2023 via open-access platforms, namely Google Scholar, SINTA, and GARUDA. The articles analyzed in this meta-analysis were the results of research using an action approach in Indonesia. This meta-analysis was performed using moderator variables, which include tenure and the number of samples of educators, such as teachers and principals, for elementary schools (Arlinwibowo et al., 2022). The discussion connects findings with existing theory and answers the research questions comprehensively.

The analysis of publication bias through funnel plots, rank correlation, and regression-based tests provides an important foundation for evaluating the credibility of the synthesized effect sizes. The funnel plot showed a generally symmetrical distribution of effect sizes around the vertical reference line, suggesting that the included studies do not exhibit a strong tendency to report only large or statistically significant effects selectively. Garzón et al., (2019) states that forest plot analysis involves aggregating data to form forests, providing a synthetic picture. Consistent with this visual pattern, both the regression and rank correlation tests produced non-significant p-values, while the coefficients, although negative, were modest in magnitude. These converging indicators collectively imply an absence of systematic publication bias affecting aggregated outcomes.

The meta-analytic summary effect size of 0.43, classified as a medium magnitude-indicates (Cohen et al., 2018) that the GROW coaching model yields a practically meaningful improvement in educators' managerial, supervisory, and pedagogical competencies. This pattern aligns with findings by research Okorie et al., (2022), who reported that a structured coaching framework, such as GROW, enhances principals' managerial capability by supporting goal clarity and reflective problem solving. Compared with international meta-analyses of coaching interventions, which typically report effect

sizes ranging from 0.30 to 0.60, the present effect size falls within the expected range, suggesting that the model performs comparably across different educational ecosystems. The findings confirm that GROW produces measurable improvement in educator competence and stands within the moderate-effect range globally, indicating that its impact is significant though not maximized.

The medium effect size can be partly explained by contextual constraints commonly observed in Indonesian schools, including variability in human-resource capacity, uneven access to professional development, and differences in principals' preparedness for managerial tasks. It meets the homogeneous assumptions and then uses the fixed-effects model (Garzón et al., 2020). As noted by Rahmat & Mirnawati (2021) and Rochaendi et al. (2022), principals often face structural limitations that restrict the degree to which coaching can translate into sustained competency growth. Therefore, while GROW provides a structured mechanism for enhancing leadership performance, its impact may depend on complementary factors such as institutional support, supervisory culture, and school resource availability. Results indicate that the GROW model is more effective among educators with 1-5 years of tenure and in samples with fewer than or equal to 20 participants, suggesting that novice educators and smaller mentoring environments may facilitate more focused competency development. The contextual moderating forces help explain why the coaching models generate a consistent but not large effect in this meta-analysis.

The findings of this meta-analysis confirm that the GROW coaching model demonstrates a consistent, statistically significant effect on strengthening educators' competencies, particularly pedagogical competencies. These outcomes reinforce the broader theoretical understanding that the effectiveness of coaching interventions in educational settings depends on school leaders' managerial capacity. As mandated in various educational leadership frameworks, principals are required to exhibit managerial, personal, social, entrepreneurial, and supervisory competencies. Prior research has demonstrated that principal leadership characterized by strong managerial proficiency significantly influences school organization and the performance of both human and material resources (Agustini et al., 2020). Managerial competence enables principals to mobilize school members coherently to implement planned programs (Huck & Zhang, 2021) and to manage interrelated institutional systems effectively (Nurhaco et al., 2021). Within this organizational context, academic supervision emerges as a critical managerial practice, serving not only to evaluate but also to guide teacher instructional performance, which ultimately contributes to student learning outcomes (Nurhasanah et al., 2020).

The positive effects identified in this meta-analysis align with previous studies indicating that supervision and coaching play a substantial role in addressing instructional weaknesses and enhancing teacher professional growth. Murtikusuma et al., (2019) demonstrated that structured supervision assists teachers in overcoming deficiencies in the learning process, while subsequent studies emphasize that continuous mentoring provides essential feedback for teachers' knowledge development, problem identification, and lesson preparation (Lisnasari et al., 2023; Murtikusuma et al., 2019). In this regard, the GROW coaching model has been widely recognized as an effective framework for strengthening principals' managerial skills (Anthony et al., 2018; Barner & Higgins,

2007; Russell et al., 2020; Stoetzel & Taylor-Marshall, 2022). As noted by Okorie et al., (2022) the GROW model enables principals to refine their capacity to guide teachers through structured problem-solving conversations, particularly in elementary school contexts. Its systematic nature helps school leaders diagnose the root causes of instructional challenges and formulate actionable strategies to support teachers' pedagogical decision-making (Slam, 2020). These theoretical assertions corroborate the meta-analytic evidence that coaching interventions structured around the GROW framework yield substantive gains in various educator competencies. Moreover, the development of pedagogical competence remains central to the success of teaching and learning. According to Khaled (2022) pedagogical competence encompasses teachers' abilities to understand their students, design instruction, create conducive learning environments, and conduct assessment and evaluation. The effectiveness of the GROW model demonstrated in this study suggests that structured coaching supports teachers in deepening these core competencies, thereby reinforcing its relevance for teacher professional development programs.

This meta-analysis also examined publication bias to strengthen the validity of its conclusions. The funnel plot showed a symmetrical distribution of effect sizes around the vertical axis, indicating no visual signs of publication bias. This interpretation was subsequently corroborated using statistical diagnostics, namely the Fails-Safe N, rank correlation, and regression-based Egger test. According to Pustejovsky & Tipton (2022), the regression-based Egger test is used to identify a potential linear relationship between the intervention effect and its standard error, which can indicate small-study effects. The rank correlation test, on the other hand, examines the association between sampling variance and the estimated intervention effect (Retnawati et al., 2018; Ridwan et al., 2022; Widana, 2022). As noted by Borenstein et al. (2009), if the majority of study results cluster on one side of the vertical line in a funnel plot, this pattern signals publication bias. In the present study, publication bias analyses confirmed a symmetrical distribution of evidence in the evidence structure underlying GROW effectiveness. As emphasized by Vitta & Al-Hoorie (2020), publication bias occurs when research findings do not systematically reflect the population and should therefore be avoided. These findings were further validated using regression and rank correlation tests, all of which yielded  $p$ -values  $> 0.05$  for the moderator variables. As noted by Nakagawa et al. (2022), funnel plot analysis serves as a reliable tool for initial bias detection; however, it must be supplemented with statistical tests to establish robustness. The convergence of these analyses confirms that the synthesized findings in this study are stable, unbiased, and methodologically reliable.

Overall, the results of this meta-analysis align closely with the literature, demonstrating that structured training and coaching interventions positively influence teacher competence. The persistent need for high-quality teacher professional development is well documented, particularly given that declining teacher performance has direct implications for instructional quality and educational outcomes (Murni, 2018; Rahman, 2021). Effective learning design, school management practices, and program implementation depend substantially on teachers' ability to perform at a high professional level. Several studies emphasize that well-designed training programs help address these concerns (Isnawan & Sudirman, 2022; Hassan & Nurahimah, 2019). In this context, the GROW

coaching model offers a theoretically grounded, empirically validated approach to enhancing educators' competencies. The evidence synthesized in this meta-analysis thus underscores its value as a professional development strategy and highlights its potential for broader application across diverse educational settings. The novelty of this study lies in its statistical synthesis of GROW intervention outcomes across Indonesian empirical publications, presenting effect-size-based evidence rather than narrative synthesis alone. Previous reviews have cataloged the use of coaching models. Still, no study has quantified the magnitude and moderator patterns with the depth presented here, thereby positioning this meta-analysis as a foundational baseline for future policy and training interventions.

This meta-analysis introduces a significant advancement to the global coaching literature by generating the first comprehensive, effect-size-driven evaluation of the GROW coaching model in the Indonesian educational system—an area previously dominated by small-scale, methodologically inconsistent action research. Unlike existing international reviews that examine coaching generically or focus on Western institutional contexts, this study isolates the GROW framework, quantifies its aggregated impact, and systematically assesses moderators such as educator tenure and sample-size structure. The integration of heterogeneity diagnostics, publication bias verification, and random-fixed model comparison provides a methodological rigor that surpasses that of prior regional analyses. Consequently, this study not only expands theoretical understanding of how coaching models function in developing countries but also establishes a scalable, evidence-based foundation that international scholars can use for cross-cultural comparison and model refinement.

In addition to presenting empirical confirmation, these findings hold practical importance for education policy, teacher training, and school principal development. The demonstrated effectiveness of the GROW model suggests that policy-makers may integrate GROW-based coaching into national professional development frameworks, particularly for novice teachers who showed stronger response outcomes. Its structured approach can also be adopted in principal preparation programs to strengthen managerial and supervisory competencies at the institutional level. Schools could incorporate GROW into continuous mentoring and supervision cycles, allowing the model to function not only as an intervention but also as a routine professional culture that promotes reflective teaching, measurable performance improvement, and collaborative problem-solving.

#### **4. Conclusion**

This meta-analysis provides rigorous empirical confirmation that the GROW coaching model exerts a statistically significant and practically meaningful impact on educators' managerial, supervisory, and instructional competencies, as evidenced by a moderate pooled effect size of 0.43 and a 95% confidence interval extending to 0.70, with publication-bias diagnostics (funnel plot symmetry, regression, and rank-correlation tests) affirming the reliability of the synthesized evidence. The primary novelty of this study lies in delivering the first comprehensive, effect-size-driven synthesis of GROW-based interventions within the Indonesian educational context, advancing beyond prior narrative reviews by integrating heterogeneity testing, random-fixed model

comparisons, and multi-method bias verification across 22 empirical studies. The findings underscore the strategic relevance of integrating structured GROW coaching into national teacher professional development, school-based supervision systems, and principal preparation programs, while also highlighting its scalability and suitability for resource-limited contexts. Nonetheless, the study's scope remains constrained by its focus on elementary-level publications and a predominantly Indonesian context; therefore, future research should incorporate broader educational levels, international databases, and additional contextual moderators to enhance generalizability and support more robust policy recommendations for coaching-driven educational reform.

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