



International Journal of Educational Methodology

Volume 9, Issue 1, 237 - 248.

ISSN: 2469-9632

<https://www.ijem.com/>

Meta-Analysis: The Influence of Local Wisdom-Based Learning Media on the Character of Students in Indonesia

Furtasan Ali Yusuf 

Bina Bangsa University, INDONESIA

Received: October 19, 2022 • Revised: December 22, 2022 • Accepted: February 11, 2023

Abstract: This research aims to prove and find out the influence of local wisdom-based learning media on the character of students in Indonesia. This research uses a quantitative method with a meta-analysis approach. The research data were analyzed using the 0.8.5 version of JASP software. The eligibility criteria used include: (a) The publications must be searchable in search databases such as Google Scholar, ERIC, DOAJ, Research Gate, and or ScienceDirect; (b) The publications are reputable indexed; (c) The publications must relate to learning media based on local wisdom and student character; (d) The publications must be in the range of 2015 to 2023; (e) The articles are worth (r), (t), or (F); (6) $N \geq 30$. The results of the analysis of 30 studies showed that there was a significant effect of learning media on the character of students in Indonesia ($z = 9.700$; $p < .001$; 95% CI [.987; 1.487]). This effect is categorized as very strong ($rRE = 1.237$). This meta-analysis study is the result of accurate, valid, and representative research reviewed because publication bias was not detected. Thus, it can be concluded that learning media based on local wisdom has a big influence on student character.

Keywords: Local wisdom-based learning media, meta-analysis, students' character.

To cite this article: Yusuf, F. A. (2023). Meta-analysis: the influence of local wisdom-based learning media on the character of students in Indonesia. *International Journal of Educational Methodology*, 9(1), 237-248. <https://doi.org/10.12973/ijem.9.1.237>

Introduction

The Industrial Revolution Era 4.0, which promotes knowledge as the main spear, is at the center of the 21st century. However, having only knowledge is not enough to realize the Era of the Industrial Revolution 4.0 because it is necessary to balance knowledge and skills as the basis for quality human resources in these changing times. Skills can be sharpened through habituation and fulfillment of life's needs in various ways based on knowledge. Therefore, learning in the 21st century is expected to open wider employment opportunities and expand employment opportunities for Indonesian people as quality and superior human resources (Alpaydin & Demirli, 2022; Nadiroh et al., 2021; Santos, 2017). This causes students to master the six C's the 21st century's skills. They are character, citizenship, critical thinking, creativity, collaboration, and communication (Anugerahwati, 2019; Kembara et al., 2022).

Character is a quality that an item or person possesses. This trait is unique and derived from the personality of the thing or person. In addition, it is the "engine" that drives how a person behaves, utters, responds to something and acts (Hadi et al., 2015; Zakso et al., 2021) Character can also be seen as internal standards that are expressed in several guises of self-worth (Izzati et al., 2019). Values and methods of thinking that are exhibited in action are the foundation of one's own character. In Indonesia, the implementation of 18 values included in educational modules help to develop character education originating from religion, culture, national education goals and Pancasila. They are religious, tolerant, honest, hard-working, disciplined, environmentally-caring, independent, creative, bibliophilic, curious, democratic, motherland-loving, nation-loving, friendly/communicative, respectful for achievement, responsible peace-loving, and socially caring, (Rihatno et al., 2020; Suastra et al., 2017). The World Economic Forum defines character qualities as consisting of curiosity, cultural awareness initiative, adaptability, persistence/grit, social and leadership (Panggabean, 2022; Tannir & Al-Hroub, 2013). Furthermore, Lickona (1996) stated that good character includes: moral feeling, moral knowing, and moral action. Moral awareness, understanding of moral principles, viewpoints, moral reasoning, decision-making, and self-consciousness are all parts of moral knowing. Conscience awareness, loving goodness, self-worth, self-control, empathy, and humility are examples of moral feelings. Competence, kindness, and

* **Correspondence:**

Furtasan Ali Yusuf, Bina Bangsa University, Serang City, Indonesia. ✉ fay@binabangsa.ac.id



habits are components of moral behavior. There are three primary components to the character. They are doing good deeds, enjoying good deeds, and knowing good deeds (Hanafi, 2021; Zurqoni et al., 2018).

Character education aims to enhance the effectiveness of implementation and educational outputs that result in the development of student character and morals formation conducted in a holistic, integrated, and balanced way (Rihatno et al., 2020; Suastra et al., 2017). Character education can trigger children's emotional intelligence because emotional intelligence is a provision for children to face all kinds of challenges. One of the challenges is children's academics. Due to the presence of character, children are not shackled by materialistic traits. On the other hand, the character can trigger a harmonious relationship for students with their society and surroundings. In addition, character is the key to human success (Hadi et al., 2015; Izzati et al., 2019; Zakso et al., 2021).

Based on the aforementioned research, the primary schools that implement thoughtful character education seriously tend to have high academic achievement. Furthermore, instilling character education does not only give affective values but also cognitive values (Asrial et al., 2022; Hanafi, 2021; Lukman et al., 2021; Rihatno et al., 2020; Suastra et al., 2017; Zurqoni et al., 2018). There is a strong influence of student character on all types of school achievement, both academic and extracurricular (Tannir & Al-Hroub, 2013). Character education can develop the potential of students to have cultural values and national character, instill a spirit of leadership and student responsibility in the next generation of the nation by helping students form admirable habits and behaviors that are consistent with national cultural traditions as well as the global ideals of faiths (Kamaruddin, 2012; Panggabean, 2022; Suciptaningsih & Haryati, 2020; Zakso et al., 2022).

The importance of character education reinforces the notion that the character of a nation greatly influences how the nation's condition will be in the future. So it is necessary to have character education that can design the future of the nation through education (Kamaruddin, 2012; Panggabean, 2022). Nowadays, character education becomes the focus of Indonesian national education. Quality character needs to be formed and nurtured from an early age because it will shape someone's personality in his or her adulthood. This results in character education as the key to success in developing children's character. Moreover, character education is increasingly becoming urgent to be implemented in educational institutions, especially in basic education due to the emergence of various kinds of non-educational behavior that are harmful (Rosala & Budiman, 2020; Suciptaningsih & Haryati, 2020; Yanti et al., 2022).

However, in reality, Indonesian character education has not achieved its maximum results in its application in everyday life. Based on the report of the 2018 Corruption Perception Index (CPI) score for Transparency International Indonesia (TII) has improved. Indonesia has a 38 on the CPI scale and is placed 89th overall. As the 89th most corrupt country, it is clear that there is a very serious moral degradation in Indonesia (Hadi et al., 2015; Zakso et al., 2021). This should not have happened in a country that has the ideology of Pancasila which is rich in the noble values of the nation. Another clear evidence of this shift is the emergence of acts of violence by children. The current condition of Indonesian children based on the 2015 KPAI report shows that children who become perpetrators of violence have increased. There were 67 cases of children who committed acts of violence in 2014. In contrast, 79 cases were reported in 2015. Additionally, from 46 cases in 2014 to 103 cases in 2015, minors were involved in conflicts (Hanafi, 2021; Izzati et al., 2019; Zurqoni et al., 2018). This shows that there are still many immoral behaviors committed by children. This immoral behavior is evidence of the fading of character in children. On the other hand, character is an important aspect of a nation because it is the fundamental foundation needed in building a nation. Therefore, a good nation is a nation that is built by prioritizing aspects of character.

Indonesia is an archipelagic nation with a variety of civilizations, races, ethnicities, beliefs, religions, and languages. *Bhineka Tunggal Ika* (Unity in Diversity), which indicates Indonesia is one nation despite having a variety of cultures, is the country's motto. The wealth and beauty of Indonesia are derived from its diversity (Hadi et al., 2015; Hastuti et al., 2023). Indonesia has various traditions and local wisdom values that must be protected and cultivated so that the character and qualities of the Indonesian people with their different cultural values do not disappear along with the negative impacts of materialism and individualistic culture. Furthermore, in the framework of the Indonesian nation-ability state's to survive in the current period of globalization and the digital age, numerous local values and traditions have emerged as a very significant force (Armawi & Limbongan, 2022; Murwati et al., 2022). National character and identity are created because of the existence of various local cultures that have been proven to be able to make this nation more dignified.

Ismail et al. (2015) and Satria et al. (2020) stated that the word local wisdom is used to indicate the existence of a concept that in local socio-cultural life, there is nobility, high values, truth, kindness, and beauty that are valued by members of the community so that it is used as a guideline to build patterns of relations between residents or as the basis for building their life goals. Local wisdom values can serve as the foundation for character education in schools. Certain communities that support cultural values which can be categorized as local geniuses or local knowledge can use the values as a source to support the community (Efendi & Ambarita, 2021; Usmeldi & Amini, 2020). Local wisdom that reflects excellent cultural values is used as teaching aids or other educational resources. Unfortunately, these local wisdom values have not been seriously included in the national education improvement agenda. The uniformity of subject matter is still visible in schools even though there has already been a local content curriculum (Bulkani et al.,

2022; Constantinus et al., 2009; Dewi et al., 2019; Hastuti et al., 2023; Wirawan et al., 2018). Therefore, creativity and innovation are needed to integrate local wisdom values into the learning activities in schools under the umbrella of national character education.

According to Mukaromah et al. (2022) and Syamsi and Tahar (2021), local wisdom-based learning can be defined as integrating local wisdom into subjects that are carried out carefully so that they can be integrated harmoniously. Thus, there is no overlap or overload in its implementation. Local wisdom-based learning can also be defined as learning that originates from the social and social environment of students by connecting the lessons being studied with their everyday life (Anggraeni & Mundilarto, 2020; Armawi & Limbongan, 2022; Yanti et al., 2022). One example of local wisdom-based creativity and innovation in learning is the use of local wisdom-based learning media. Learning media based on local wisdom is learning that connects the learning process with existing wisdom in the surrounding environment, such as regional food, regional dances, language, etc. (Bulkani et al., 2022; Hastuti et al., 2023; Sisfadilla et al., 2021). The benefits of local wisdom-based learning media are to increase students' understanding of the material studied, to develop their knowledge related to the material, to introduce local wisdom to them, and to familiarize them with the concrete situations around them (Asrial et al., 2022; Hadi et al., 2015).

Based on the aforementioned background above, a learning process based on local knowledge can help character grow. To make a clear description of the influence of local wisdom-based learning media on the character of students in Indonesia, it is necessary to do meta-analysis study. This study is the first meta-analytic analysis to examine on where local wisdom-based learning media affects students character across cultures, including Indonesia. Therefore, this study intends to demonstrate and establish using a meta-analysis strategy for examine the impact of local wisdom-based learning-media on the character of students in Indonesia.

Methodology

Research Design

This study employs a quantitative method and a meta-analysis strategy. A quantitative research technique called meta-analysis systematically combines data from several studies which are processed and then drawn into statistical conclusions. The research data is expressed by the effect size. Effect size is a quantitative index/reflection of the magnitude of the relationship between variables used to summarize research findings into a meta-analysis (Chamdani et al., 2022). This study examines the effect size of research related to the effect of local wisdom-based learning media on student character. Meta-analytic research was chosen because researchers consider meta-analysis to be more sophisticated in summarizing research findings than conventional reviews which rely on qualitative summaries and sometimes still contain an element of subjectivity (Yusuf & Fajari, 2022). In addition, meta-analysis can also handle a large number of research findings in a structured and organized manner because it has certain rules for selecting and computing the statistically appropriate effect sizes (Chamdani et al., 2022).

Eligibility Criteria

The studies examined in this research have several criteria such as: (a) The publications must be searchable in search databases for both national and international journals such as Google Scholar, ERIC, DOAJ, Research Gate, and or ScienceDirect; (b) The publications are indexed from a minimum to maximum index; (c) The publications must relate to learning media based on local wisdom and student character; (d) The publications must be in the range of 2015 to 2023; (e) The articles are worth (*r*), (*t*), or (*F*); (6) $N \geq 30$. An example of low-level indexed publications is Google Scholar, while an example of mid-level indexed publications is the DOAJ, the Copernicus Index, and SINTA. SINTA is an indexing journal portal managed by the Republic of Indonesia's Ministry of Education and Culture. SINTA consists of 6 categories called sequentially from the best SINTA 1 to SINTA 6. While SINTA 3 and 4 are equivalent to the index of international publications, namely the Copernicus Index. The high-level publication indexes are Web of Science and Scopus. This meta-analysis research examined 30 studies that were searched using several keywords such as "LOCAL WISDOM CHARACTER QUANTITATIVE", "LOCAL WISDOM MEDIA CHARACTER QUANTITATIVE", "LOCAL WISDOM CURIOSITY QUANTITATIVE", "LOCAL WISDOM INITIATIVE QUANTITATIVE", "LOCAL WISDOM INNOVATIVE QUANTITATIVE", "LOCAL WISDOM PERSISTENCE QUANTITATIVE", "LOCAL WISDOM GRIF QUANTITATIVE", "LOCAL WISDOM ADAPTABILITY QUANTITATIVE", "LOCAL WISDOM LEADERSHIP QUANTITATIVE", "LOCAL WISDOM CULTURE QUANTITATIVE", "LOCAL WISDOM AWARENESS QUANTITATIVE", "LOCAL WISDOM SOCIAL QUANTITATIVE", etc.

Data Encoding

Data coding is very important in administering research results that will be aggregated in meta-analysis research. The coding of research data was carried out by considering specific aspects of the study such as name, year, number of samples (*N*), *r*, *t*, and *F* values, sample characteristics, and journal index. The following is the result of the data coding of this meta-analysis research.

Table 1. Data Coding

No.	Author	N	r	t	F	Characteristics	Index
1.	Ismail et al. (2015)	64		89,676		Senior high school students	Copernicus Index
2.	Satria et al. (2020)	148	0.596			Senior high school students	Copernicus Index
3.	Hadi et al. (2015)	21	0.948			Senior high school students	Copernicus Index
4.	Iskandar and Hamdani (2017)	96	0.818			Elementary school students	DOAJ
5.	Efendi and Ambarita (2021)	20	0.865			Elementary school students	DOAJ
6.	Jufrida et al. (2021)	24	0.895			Senior high school students	Google Scholar
7.	Widiana et al. (2019)	24		9,240		Elementary school students	SINTA 2
8.	Yanti et al. (2022)	25		18.17		Elementary school students	SINTA 2
9.	Anggraeni and Mundilarto (2020)	480	0.816			Senior high school students	SINTA 2
10.	Priyanga et al. (2022)	10	0.405			Elementary school students	SINTA 2
11.	Sartono et al. (2021)	81	0.976			Elementary school students	SINTA 2
12.	Asrial et al. (2022)	44		9,273		Elementary school students	SINTA 2
13.	Subali et al. (2015)	74	0.62			Teachers	SINTA 2
14.	Abidinsyah et al. (2019)	41	0.951			Teachers	SINTA 2
15.	Hanifah et al. (2022)	130		2,293		Senior high school students	SINTA 2
16.	Nabila et al. (2021)	54	0.791			Elementary school students	SINTA 3
17.	Novitasari et al. (2022)	33		1,522		Elementary school students	SINTA 3
18.	Sisfadilla et al. (2021)	20	0.956			Elementary school students	SINTA 3
19.	Ridho et al. (2021)	65	0.702			Junior high school students	SINTA 3
20.	Ginting and Hasan (2022)	15		9,857		Students	SINTA 4
21.	Afifah et al. (2022)	30	0.833			Elementary school students	SINTA 5
22.	Wastuti et al. (2021)	32	0.986			Elementary school students	SINTA 5
23.	Wijayanti et al. (2022)	35	0.945			Elementary school students	SINTA 6
24.	Hunaepi et al. (2019)	105	0.702			Students	ESCI's Web of Science
25.	Bulkani et al. (2022)	123	0.615			Elementary school students	Scopus Q1
26.	Hastuti et al. (2023)	56		2,749		Elementary school students	Scopus Q1
27.	Suastra et al. (2017)	30	0.458			Teachers	Scopus Q2
28.	Usmeldi and Amini (2020)	50	0.842			Junior high school students	Proceeding Scopus
29.	Dewi et al. (2019)	258		13.195		Junior high school students	Proceeding Scopus
30.	Sudarmin et al. (2016)	65	0.656			Junior high school students	Proceeding Scopus

Research Procedure

Data research analysis was carried out using the 0.8.5 version of JASP software through the following steps: (a) determining the research statement, namely the relationship between variables with individual differences research categories; (b) determining the eligibility criteria; (c) performing data coding; (d) conversion of t to r values (because in this study there were no publications that had an F); (e) conducting heterogeneity test; (f) calculating the effect size (ES) and standard error (SE); (g) calculating the summary effect size; (h) testing the hypothesis, and (i) conducting publication bias check. The following is the formula used for converting t and F values to r (correlation):

$$F = t^2$$

$$t = \sqrt{F}$$

$$r = \frac{t}{\sqrt{t^2 + N - 2}}$$

The following is the formula for effect size (ES) and standard error (SE) calculations:

$$z = Y_i = 0,5 \times \ln \frac{1+r}{1-r}$$

$$V_z = V_{Y_i} \frac{1}{n-3}$$

$$SE_z = SE_{Y_i} \sqrt{V_z}$$

The summary effect size sought in this study is categorized based on Cohen's effect (Correll et al., 2020) size criteria. The Cohen's size effect criteria can be seen in Table 2 below.

Table 2. The Cohen's Effect Size Criteria

Value	Criteria
0 until .1	Weak effect size criteria
< .3	Modest effect size criteria
< .5	Moderate effect size criteria
< .8	Strong effect size criteria
$\geq .8$	Very strong effect size criteria

Results

There are a total of 2253 research samples from 30 publications reviewed from various levels of education. Based on the 30 research publications, the researchers obtained some information regarding the values of r , t , and F . Afterwards, they were converted and the effect size of each research was calculated. Before conducting the hypothesis testing stage, it is necessary to do a heterogeneity test. The heterogeneity test results for each publication effect size are reviewed as follows.

Table 3. The Heterogeneity Test Results

	Q	df	p
Omnibus test of Model Coefficients	94.09	1	< .001
Test of Residual Heterogeneity	749.75	29	< .001

Note. p value are approximate

Table 4. The Residual Heterogeneity Test Results

	Estimates	lower bound	Upper bound
τ^2	0.4575	0.2786	0.8445
τ	0.6764	0.5279	0.9189
I^2 (%)	96.8930	94.9981	98.2923
H^2	32.1854	19.9923	58.5575

Tables 3 and 4 show that the 30 publications reviewed came from heterogeneous distributions. p -value < 0.001; $Q = 94.09$; τ^2 or $\tau > 0$; and I^2 (%) = 96,893 which is close to 100%. The summary effect size or mean effect size test is the next test phase. The findings of the study of the mean effect size or summary effect are shown in Table 5 below.

Table 5. The Results of the Summary Effect Size Test

	Estimated	Standard Error	z	p	Lower bound	Upper bound
intercept	1.2368	0.1275	9.7000	< .001	0.9869	1.4867

Note. Wald test.

Table 5 shows that the value of p is < .01. It means that there is an effect of local wisdom-based learning media on character student in Indonesia. This influence can be categorized as a strong influence based on the Cohen influence criteria because the estimated standard error is 1.237 [.987; 1,487]. The results of the summary effect size test can also be observed through the following forest plot graph.

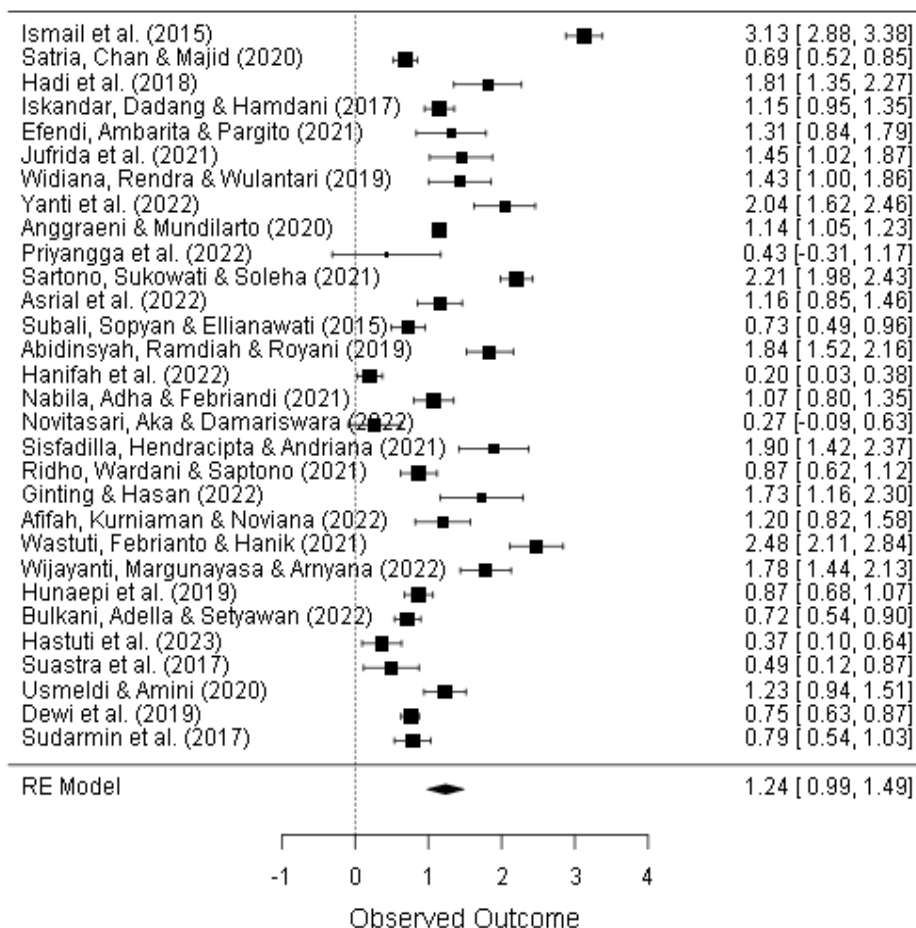


Figure 1. The Forest Plot

Figure 1 shows that all studies reviewed have a significant effect size. The trend of the correlation value of the studies is indicated by the size of the points and directions. Furthermore, the final step in this meta-analytic research is to check for publication bias. In this study, checking for publication bias was carried out through funnel plot analysis, Egger Test, and fail-safe *N*. The 30 papers that were examined for this study are shown in the following funnel plot graph.

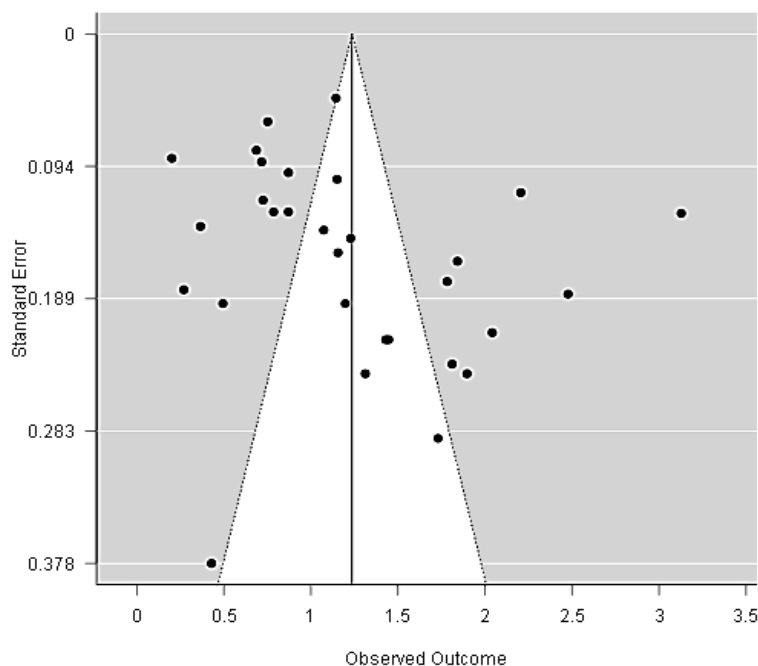


Figure 2. The Funnel Plots

Figure 2 shows that the study points reviewed in this research are dominantly above the curve. It indicates that the effect size estimate is accurate. From the distribution of study points, it is difficult to conclude that this meta-analysis research is symmetrical or asymmetrical which indicates publication bias. So, further tests were carried out with the Egger test. The following are the results of the Egger test.

Table 6. The Egger Test Results

	z	p
sei	1.1034	0.270

Table 6 above shows that the *p-value* is $> .05$. It means that the study distribution on the Funnel Plot curve is symmetrical. A funnel plot that is declared symmetrical indicates that there is no publication bias. Furthermore, to increase the validity related to the publication bias of this meta-analysis, a Fail-safe *N* test was performed. The following are the results of the Fail-safe *N* test of the 30 studies reviewed in this research.

Table 7. Fail-Safe *N* Test Results

	Failsafe N	Target Significance	Observed Significance
Rosenthal	25030	.05	$< .001$

Fail-safe *N* is used to detect file-drawer effects. A file drawer is a label given to unpublished research for insignificant reasons. The Table 7 show that the fail-safe *N* value is 25030. It is suspected that there are around 25030 studies or publications whose results are biased, so these studies are not published. Then, the fail-safe *N* value will be compared with the $5K + 10$ value because $K = 30$, so $5(30) + 10 = 160$. It is further known that the fail-safe *N* value is 25030 with a target significance of .05 and $p < .001$. It means that the fail-safe *N* value $>$ the value of $5K + 10$. The findings of this meta-analysis investigation show that there is no publication bias.

Discussion

The 30 publications reviewed came from heterogeneous distributions. So, that fact showing that it would be possible to examine into other moderator factors that have an impact on the correlation of local wisdom-based learning media with character. If the heterogeneity test shows insignificant results, it can be considered that the study results are quite homogeneous and the fixed size model should be used to decide the appropriate statistical analysis test. In this research, the heterogeneity test produced meaningful conclusions, so the random effect model test was applied. The heterogeneity test is very important because it is used as a prerequisite test in determining the next test stage (Chamdani et al., 2022; López-Hernández et al., 2022; Yusuf & Fajari, 2022).

Based on the result of the summary effect size test, it can be concluded that that there is a strong effect of local wisdom-based learning media on character student in Indonesia. Also, based on forest plot, it can be shows that all studies reviewed have a significant effect size. Based on analyzing the size of the points and directions, almost all of the studies reviewed in this study have black dots that are quite broad/large. Besides, the direction of the line tends to be to the right of the criteria. The black dots in the forest plot, called bar plots, are the confidence intervals for the point estimation results of each study. The lines on the right and left of the bars are the area of the lower and upper limits of the weights of each study. The area and stem of each study are located to the right of the aggregate boundary line, which means they are more significant (Chang et al., 2022; Chattopadhyaya et al., 2021; Dettori et al., 2021; López-Hernández et al., 2022).

The local wisdom having noble values, manners, and customs, growing in society, integrated, and implemented in character education in every school lesson can shape children's character under the goals of National Education. Besides, it can help them to develop students' intelligence, good personality, and noble character so that children who are studying can fortify themselves and be ready to face the impact of the industrial revolution 4.0 (Asrial et al., 2022; Sukadari et al., 2019; Yanti et al., 2022). Furthermore, local wisdom can shape human character through learning values that are carried out in formal and informal environments (Sartono et al., 2021; Ulfie, 2015). Local cultural wisdom-based character education aims to achieve quality efficiency, current human resources need adopt attitudes and practices and meet a variety of challenges in the future, which tends to make local wisdom significant and necessary as the framework for character education (Asrial et al., 2022; Hayati et al., 2020; Ramdiah et al., 2020; Yanti et al., 2022).

In this study, checking for publication bias was carried out through funnel plot analysis, Egger test, and fail-safe *N*. The funnel plot shows that the study points reviewed in this research are dominantly above the curve. It indicates that the effect size estimate is accurate. The Egger test result also show that the study distribution on the funnel plot curve is symmetrical. The last, fail-safe *N* test result show that there is no publication bias. So, it shows that this meta-analysis study's findings can be scientifically justified. Publication bias is a very important aspect of meta-analytic research. Publication bias is caused by research results that accept null or negative hypotheses but tend not to be published

compared to research results that show a positive effect. Usually, researchers are less motivated to publish the results of research that must accept the null hypothesis or have no significant effect (Chamdani et al., 2022; Yusuf & Fajari, 2022).

Conclusion

On the assumption of the research's findings and discussion, it can be concluded that local wisdom-based learning media have an effect on Indonesian students' character. This can be proven by the summary effect size of 30 publications which can be categorized as a strong influence. The data analysis of this meta-analysis research can be said to be accurate, valid, and reliable because there is no publication bias through various publication bias tests. So, it can be concluded that this research can strengthen theories or studies regarding the application of local wisdom-based learning media at various levels of education because it has proven to be very influential on student character.

Recommendations

Based on the conclusion, it is recommended for teachers or practitioners to develop media based on local wisdom more deeply and disseminate it. It is better if they should support the teaching and learning process in schools using learning media, so that students are more active and not feel bored quickly, they can also easily accept the subject matter by student. Another recommendation is that researchers can examine the possibility of other variables that can be used as other dependent variables related to local wisdom such as citizenship which also belongs to one of the six C's of the 21st-century skills. Another limitation of this research also lies in the research subjects who have not focused on one level. Therefore, future researchers can examine the same variables, specifically at certain levels because they do not rule out the possibility that there are different influences at each level of education.

Limitations

The limitation of this research lies in the geographical element because this research is conducted only in one country. Even though Indonesia is recognized as a nation with a variety of cultures and local wisdom, similar research in other countries is also urgently conducted.

References

- Abidinsyah, A., Ramdiah, S., & Royani, M. (2019). The implementation of local wisdom-based learning and HOTS-based assessment: Teacher survey in Banjarmasin. *Jurnal Pendidikan Biologi Indonesia*, 5(3), 407–414. <https://doi.org/10.22219/jpbi.v5i3.9910>
- Afifah, N., Kurniawan, O., & Noviana, E. (2022). Pengembangan media pembelajaran interaktif pada pembelajaran bahasa Indonesia kelas III sekolah dasar [Development of interactive learning media in Indonesian language learning for class III elementary schools]. *Jurnal Kiprah Pendidikan*, 1(1), 33–42. <https://doi.org/10.33578/kpd.v1i1.24>
- Alpaydın, Y., & Demirli, C. (2022). *Educational theory in the 21st century: Science technology, society and education*. Springer. <https://doi.org/10.1007/978-981-16-9640-4>
- Anggraeni, T. E., & Mundilarto, M. (2020). The development of local wisdom-based physics cognitive ability assessment instrument for senior high school students. *Jurnal Penelitian Dan Pembelajaran IPA*, 6(1), 102–140. <https://doi.org/10.30870/jppi.v6i1.5718>
- Anugerahwati, M. (2019). Integrating the 6Cs of the 21st century education into the English lesson and the school literacy movement in secondary schools. *KnE Social Sciences*, 3(10), 165–171. <https://doi.org/10.18502/kss.v3i10.3898>
- Armawi, A., & Limbongan, S. A. (2022). The local-wisdom-based social capital for strengthening social resilience during the COVID-19 pandemic. *Masyarakat, Kebudayaan Dan Politik*, 35(4), 514–526. <https://doi.org/10.20473/mkp.v35i42022.514-526>
- Asrial, A., Syahrial, S., Kurniawan, D. A., Alirmansyah, A., Sholeh, M., & Zulkhi, M. D. (2022). The influence of application of local-wisdom-based modules toward peace-loving characters of elementary school students. *Indonesian Journal on Learning and Advanced Education*, 4(2), 157–170. <https://doi.org/10.23917/ijolae.v4i2.17068>
- Bulkani, Fatchurahman, M., Adella, H., & Andi Setiawan, M. (2022). Development of animation learning media based on local wisdom to improve student learning outcomes in elementary schools. *International Journal of Instruction*, 15(1), 55–72. <https://doi.org/10.29333/iji.2022.1514a>
- Chamdani, M., Yusuf, F. A., Salimi, M., & Fajari, L. E. W. (2022). Meta-analysis study: The relationship between reflective thinking and learning achievement. *Journal on Efficiency and Responsibility in Education and Science*, 15(3), 181–188. <https://doi.org/10.7160/eriesj.2022.150305>

- Chang, Y., Phillips, M. R., Guymer, R. H., Thabane, L., Bhandari, M., Chaudhary, V., Wykoff, C. C., Sivaprasad, S., Kaiser, P., Sarraf, D., Bakri, S., Garg, S. J., Singh, R. P., Holz, F. G., & Wong, T. Y. (2022). The 5 min meta-analysis: Understanding how to read and interpret a forest plot. *Eye*, 36(4), 673–675. <https://doi.org/10.1038/s41433-021-01867-6>
- Chattopadhyaya, S., Dinkar, B. K., Mukhopadhyay, A. K., Sharma, S., & Machado, J. (2021). Meta-analysis and forest plots for sustainability of heavy load carrier equipment used in the industrial mining environment. *Sustainability*, 13(15), Article 8672. <https://doi.org/10.3390/su13158672>
- Constantinus, Lako, A., & Haryanti, K. (2009). A study of local wisdom, social interest, and pro-environmental behavior in improving environmental leadership performance. *Journal of Shoutwest Jiaotong University*, 56(5), 275–293. <https://doi.org/10.35741/issn.0258-2724.56.5.25>
- Correll, J., Mellinger, C., McClelland, G. H., & Judd, C. M. (2020). Avoid Cohen’s “small”, “medium”, and “large” for power analysis. *Trends in Cognitive Sciences*, 24(3), 200–207. <https://doi.org/10.1016/j.tics.2019.12.009>
- Dettori, J. R., Norvell, D. C., & Chapman, J. R. (2021). Seeing the forest by looking at the trees: How to interpret a meta-analysis forest plot. *Global Spine Journal*, 11(4), 614–616. <https://doi.org/10.1177/21925682211003889>
- Dewi, I. N., Ibrahim, M., Poedjiastoeti, S., Prahani, B. K., Setiawan, D., & Sumarjan, S. (2019). Effectiveness of local wisdom integrated (LWI) learning model to improve scientific communication skills of junior high school students in science learning. *Journal of Physics: Conference Series*, 1157, Article 0220141. <https://doi.org/10.1088/1742-6596/1157/2/022014>
- Efendi, M., & Ambarita, A. (2021). Improving students’ creativity through development of teaching material lampung local wisdom search, draw, and make-based. *International Journal of Theory and Application in Elementary and Secondary School Education*, 3(1), 35–43. <https://bit.ly/3RIEv6r>
- Ginting, A. D., & Hasan, M. (2022). Developing an electronic module based on local wisdom in dokan village to optimize the character education. *Jurnal Ilmiah Ilmu Pendidikan*, 5(9), 3838–3843. <https://doi.org/10.54371/jiip.v5i9.947>
- Hadi, K., Dazrullisa, Manurung, B., & Hasruddin. (2015). Development of biological teaching materials based on local wisdom integrated character education and problem based learning models for senior high school in Aceh Barat-Indonesia. *International Journal of Research and Review*, 2(6), 343–347. <https://bit.ly/3ljaH46>
- Hanafi, H. (2021). Character education from the students’, teachers’, and schools’ perspective. *Journal of English Language Teaching and Linguistics*, 6(2), 283. <https://doi.org/10.21462/jelt.v6i2.545>
- Hanifah, N. H., Walid, M., Putri, C. A., Sinta, L. N., & Ningrum, D. E. A. F. (2022). Development of android-based “pete” educational game to improve elementary school student learning outcomes in social science. *Al Ibtida: Jurnal Pendidikan Guru MI*, 9(2), 430–443. <https://doi.org/10.24235/al.ibtida.snj.v9i2.11467>
- Hastuti, S., Slamet, Sumarwati, & Rakhmawati, A. (2023). Short story writing learning based on local wisdom with digital book media for university students. *International Journal of Instruction*, 16(1), 821–832. <https://doi.org/10.29333/iji.2023.16146a>
- Hayati, F. N., Suyatno, S., & Susatya, E. (2020). Strengthening of religious character education based on school culture in the Indonesian secondary school. *The European Educational Researcher*, 3(3), 87–100. <https://doi.org/10.31757/euer.331>
- Hunaepi, Firdaus, L., Samsuri, T., Susantini, E., & Raharjo. (2019). The development of textbook ecology based on local wisdom to improve scientific attitude of graduate students. *International Journal of Scientific and Technology Research*, 8(12), 16–21. <https://bit.ly/3jK38mA>
- Iskandar, D., & Hamdani, A. R. (2017). Increasing the value of mutual cooperation and students’ conceptual understanding on cooperative learning model through the performing art of Gotong Sisingaan. *SOSIOHUMANIKA: Jurnal Pendidikan Sains Sosial Dan Kemanusiaan*, 10, 223–244. <https://bit.ly/3jLvWLw>
- Ismail, R., Mahmud, A., Samad, S., & Syam, H. (2015). The effective leadership model with local wisdom for principal’s state technology high schools in Sulawesi Indonesia. *International Journal of Academic Research*, 7(1), 69–76.
- Izzati, U. A., Bachri, B. S., Sahid, M., & Indriani, D. E. (2019). Character education: Gender differences in moral knowing, moral feeling, and moral action in elementary schools in Indonesia. *Journal for the Education of Gifted Young Scientists*, 7(3), 547–556. <https://doi.org/10.17478/jegvs.597765>
- Jufrida, J., Basuki, F. R., Kurniawan, W., & Milyani, V. (2021). The development of ethnoscience based high school physics enrichment book in the traditional. *ScienceEdu: Jurnal Pendidikan IPA*, IV(1), 26–35. <https://bit.ly/3I7NLOH>
- Kamaruddin, S. A. (2012). Character Education and Students Social Behavior. *Journal of Education and Learning*, 6(4), 223–230. <https://bit.ly/3xflM8R>
- Kembara, M. D., Rozak, R. W. A., Maftuh, B., & Hadian, V. A. (2022). Research based learning to improve students 6c skills during the pandemic. *Proceedings of the 4th Social and Humanities Research Symposium*, 658, 107–111. <https://doi.org/10.2991/assehr.k.220407.020>

- Lickona, T. (1996). Eleven principles of effective character education. *Journal of Moral Education*, 25(1), 93–100. <https://doi.org/10.1080/0305724960250110>
- López-Hernández, P., Sánchez-Meca, J., Rosa-Alcázar, Á., & Rosa-Alcázar, A. I. (2022). A Meta-analytic study on executive function performance in children/adolescents with OCD. *Anales de Psicología*, 38(3), 478–488. <https://doi.org/10.6018/analesps.305411>
- Lukman, Marsigit, Istiyono, E., Kartowagiran, B., Retnawati, H., Kistoro, H. C. A., & Putranta, H. (2021). Effective teachers' personality in strengthening character education. *International Journal of Evaluation and Research in Education*, 10(2), 512–521. <https://doi.org/10.11591/ijere.v10i2.21629>
- Mukaromah, L., Mustadi, A., & Nisa, A. (2022). Study of STEM based on local wisdom in hoening science process skills in the 21st century era. *Jurnal Penelitian Pendidikan IPA*, 8(3), 1168–1174. <https://doi.org/10.29303/jppipa.v8i3.1445>
- Murwati, Y., Sumardjoko, B., & Prastiwi, Y. (2022). Thematic learning based on local wisdom in the new normal time in elementary school. *Jurnal Pend*, 11(3), 388–396. <https://bit.ly/3jI6dn4>
- Nabila, S., Adha, I., & Febriandi, R. (2021). Pengembangan media pembelajaran pop up book berbasis kearifan lokal pada pembelajaran tematik di sekolah dasar [Development of pop up book learning media based on local wisdom in thematic learning in elementary schools]. *Jurnal Basicedu*, 5(5), 3928–3939. <https://doi.org/10.31004/basicedu.v5i5.1475>
- Nadiroh, N., Zulfa, V., & Yuliani, S. (2021). Learning transformation of the 21st century curriculum for prospective teacher in term of eco-literacy. *IOP Conference Series: Earth and Environmental Science*, 802, Article 012009. <https://doi.org/10.1088/1755-1315/802/1/012009>
- Novitasari, Y., Aka, K. A., Damariswara, R., Nusantara, U., Kediri, P., & Timur, J. (2022). Pengaruh penggunaan multimedia interaktif berbasis android dan kearifan lokal terhadap materi teks nonfiksi [The effect of using android and local wisdom-based interactive multimedia on non-fiction text materials article history]. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, 11(3), 816–828. <https://doi.org/10.33578/jpkip.v11i3.8915>
- Panggabean, J. Z. Z. (2022). Reflecting the value of character education in lesson planning. *Jurnal Ilmiah Sekolah Dasar*, 6(1), 231–241. <https://doi.org/10.23887/jisd.v6i1.41427>
- Priyanga, B., Sarwi, S., Widiyatmoko, A., Herlina, E., Marwoto, P., & Sumarni, W. (2022). Development of e-comic based on local wisdom to improve scientific literacy. *Ta'dib Journal*, 25(2), 140–149. <https://doi.org/10.31958/jt.v25i2.5902>
- Ramdiah, S., Abidinsyah, A., Royani, M., Husamah, H., & Fauzi, A. (2020). South Kalimantan local wisdom-based biology learning model. *European Journal of Educational Research*, 9(2), 639–653. <https://doi.org/10.12973/eu-ier.9.2.639>
- Ridho, S., Wardani, S., & Saptono, S. (2021). Development of local wisdom digital books to improve critical thinking skills through problem based learning. *Journal of Innovative Science Education*, 9(3), 1–7. <https://doi.org/10.15294/jise.v9i1.37041>
- Rihatno, T., Safitri, D., Nuraini, S., Marini, A., Ferdi Fauzan Putra, Z. E., & Wahyudi, A. (2020). The development of character education model using stop motion animation for elementary school students in Indonesia. *International Journal of Advanced Science and Technology*, 29(8S), 103–109. <https://bit.ly/3Ywp4jM>
- Rosala, D., & Budiman, A. (2020). Local wisdom-based dance learning: Teaching characters to children through movements. *Mimbar Sekolah Dasar*, 7(3), 304–326. <https://doi.org/10.17509/mimbar-sd.v7i3.28185>
- Santos, J. M. (2017). 21st Century Learning skills: A challenge in every classroom. *International Journal of Emerging Multidisciplinary Research*, 1(1), 31–35. <https://doi.org/10.22662/ijemr.2017.1.1.031>
- Sartono, E. K. E., Sukowati, S., & Soleha, S. (2021). The effectiveness of Kahoot! based on local wisdom to improve creative thinking skill and the spirit of nationality of students in islamic elementary school. *Al Ibtida: Jurnal Pendidikan Guru MI*, 8(1), 50–59. <https://doi.org/10.24235/al.ibtida.snj.v8i1.7092>
- Satria, H., Chan, S., & Majid, M. S. A. (2020). Do local cultural wisdom and leadership matter for improving motivation and performance? *East African Scholars Journal of Economics, Business and Management*, 3(1), 93–99. <https://bit.ly/3YhTgQ2>
- Sisfadilla, R., Hendracipta, N., & Andriana, E. (2021). Pengembangan media Ruliba berbasis kearifan lokal pada pembelajaran keseimbangan ekosistem ilmu pengetahuan alam [Developing Ruliba media based on local wisdom for learning the balance of ecosystem in the natural science subject]. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, 10(3), 501–514. <https://bit.ly/3HGnBvM>
- Suastra, I. W., Jatmiko, B., Ristiati, N. P., & Yasmini, L. P. B. (2017). Developing characters based on local wisdom of bali in teaching physics in senior high school. *Jurnal Pendidikan IPA Indonesia*, 6(2), 306–312. <https://doi.org/10.15294/jpii.v6i2.10681>

- Subali, B., Sopyan, A., & Ellianawati. (2015). Pengembangan desain pembelajaran sains berbasis kearifan lokal untuk mengembangkan karakter positif di sekolah dasar [Development of local wisdom-based science learning designs to develop positive character in elementary schools]. *Jurnal Pendidikan Fisika Indonesia*, 11(1), 1–7. <https://bit.ly/3YlibSM>
- Suciptaningsih, O. A., & Haryati, T. (2020). Character education model for junior high school students based on java ethnopedagogic. *International Journal of Scientific and Technology Research*, 9(2), 201–210. <https://bit.ly/40F6zLX>
- Sudarmin, Febu, R., Nuswowati, M., & Sumarni, W. (2016). Development of ethnoscience approach in the module theme substance additives to improve the cognitive learning outcome and student's entrepreneurship. *Journal of Physics: Conference Series*, 755, Article 011001. <https://doi.org/10.1088/1742-6596/755/1/011001>
- Sukadari, Sukemi, B. M., & Sunarti. (2019). Local socio-cultural wisdom as a basis of character education in primary schools. *International Journal of Innovation, Creativity and Change*, 7(6), 298-311. <https://bit.ly/3HKEeve>
- Syamsi, I., & Tahar, M. M. (2021). Local wisdom-based character education for special needs students in inclusive elementary schools. *Cypriot Journal of Educational Sciences*, 16(6), 3329–3342. <https://doi.org/10.18844/cjes.v16i6.6567>
- Tannir, A., & Al-Hroub, A. (2013). Effects of character education on the self-esteem of intellectually able and less able elementary students in Kuwait. *International Journal of Special Education*, 28(1), 47–59.
- Ulfie, A. (2015). The local wisdom of Kei people as a source of learning local history to strengthen students' social cohesion. *Historia: Jurnal Pendidik Dan Peneliti Sejarah*, 14(1), 13-22. <https://doi.org/10.17509/historia.v14i1.1906>
- Usmaldi, & Amini, R. (2020). The effect of integrated science learning based on local wisdom to increase the students competency. *Journal of Physics: Conference Series*, 1470, Article 012028. <https://doi.org/10.1088/1742-6596/1470/1/012028>
- Wastuti, I. B., Febrianto, P. T., & Hanik, U. (2021). Development of advisor textbook based on rokat tase' local wisdom for class IV elementary school. *Widyagogik: Jurnal Pendidikan Dan Pembelajaran Sekolah Dasar*, 9(1), 92–103. <https://bit.ly/3lay6xD>
- Widiana, I. W., Rendra, N. T., & Wulantari, N. W. (2019). Media pembelajaran puzzle untuk meningkatkan hasil belajar siswa kelas IV pada kompetensi pengetahuan IPA [Puzzle learning media to improve student learning outcomes in class IV on science knowledge competence]. *Indonesian Journal of Educational Research and Review*, 2(3), 354-362. <https://doi.org/10.23887/ijerr.v2i3.22563>
- Wijayanti, D. A. I., Margunayasa, I. G., & Arnyana, I. B. P. (2022). Pengembangan e-lkpd berkearifan lokal kelas V SD [Development of local wisdom e-LKPD class V SD]. *PENDASI: Jurnal Pendidikan Dasar Indonesia*, 6(1), 141–152. <https://bit.ly/3I8m2wU>
- Wirawan, G., Waluyo, H. J., Suwandi, S., & Widodo, T. S. (2018). Mendu traditional theater as a treasure of the local wisdom of west kalimantan. In Sumarlam, S. T. Widodo, W. Abdullah, D. Purnanto, P. A. W. Wibowo & A. A. Ardanareswari (Eds.). *Proceeding of the International Seminar on Recent Language, Literature, and Local Cultural Studies (BASA 2018)* (Vol. 280, pp. 98-103). Atlantis Press. <https://124.im/Q3uOR1>
- Yanti, F. A., Sukarelawan, M. I., Thohir, M. A., & Perdana, R. (2022). Development of scientific learning model based on local wisdom of "Piil Pesenggiri" to improve process skills and character values of elementary school students. *Jurnal Penelitian Pendidikan IPA*, 8(2), 499–506. <https://doi.org/10.29303/jppipa.v8i2.1236>
- Yusuf, F. A., & Fajari, L. E. W. (2022). Key success factors of various quality assessment institutions and quality of higher education services: A meta-analysis study. *Eurasian Journal of Educational Research*, (98), 184–202. <https://bit.ly/3Yuk13C>
- Zakso, A., Agung, I., Sofyatiningrum, E., & Calvin Capnary, M. (2022). Factors affecting character education in the development of the profile of pancasila students: The case of Indonesia. *Journal of Positive School Psychology*, 6(2), 2254–2273. <https://bit.ly/3jF2kj1>
- Zakso, A., Agung, I., Susanto, A. B., & Calvin Capnary, M. (2021). The effect of strengthening character education on tolerance increasing and development of Pancasila students in border area: Case of West Kalimantan province. *Academic Journal of Interdisciplinary Studies*, 10(5), 232–248. <https://doi.org/10.36941/ajis-2021-0136>
- Zurqoni, Retnawati, H., Apino, E., & Anazifa, R. D. (2018). Impact of character education implementation: A goal-free evaluation. *Problems of Education in the 21st Century*, 76(6), 881–899. <https://doi.org/10.33225/pec/18.76.881>