



Impact of holistic learning models on character development: a systematic review

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Abstract. *Introduction.* Character education for a developing personality, through a holistic educational process, emphasises the cultivation of ethical values such as honesty, responsibility, empathy, and self-discipline. These values are essential for individuals to coexist harmoniously within societal norms. Promoting a holistic personality in education requires an integrated approach that encompasses the cognitive, emotional, social, and spiritual development of students. This approach aims to balance academic achievement with character development. *Aim.* The study aims to analyse global trends in the impact of holistic educational models on the development of an individual's character. *Methodology and research methods.* The methodological foundation of this study employed a systematic approach to review the findings of theoretical and empirical research published in reputable international journals indexed by Scopus, covering the period from 2016 to 2024 on the specified topics. Data analysis was conducted using the bibliometric application Biblioshiny (RStudio) and the qualitative data analysis software package NVivo. *Scientific results and novelty.* The research findings indicate that holistic learning positively influences the development of moral behaviour and enhances student learning outcomes. It is observed that integrating educational elements into formal curricula, along with teaching methods that emphasise contextual experience and self-reflection, improves students' abilities to think critically, collaborate, and solve problems. *Scientific novelty.* According to the study, integrating models of holistic learning with the education of moral character traits within a single conceptual framework suggests that an individual's moral and academic development can mutually reinforce one another. *Practical significance.* The practical significance of this research lies in the formulation of recommendations for creating holistic curricula and strategies that promote both high academic achievement and the cultivation of moral character traits among students, thereby fostering their growth as responsible citizens of their country.

Keywords: academic abilities, learning models, personality development, character formation, holistic learning

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Влияние целостных моделей образования на становление характера развивающейся личности: систематический обзор

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Аннотация. Введение. Воспитание характера развивающейся личности в ходе целостного образовательного процесса фокусируется на развитии этических ценностей, таких как честность, ответственность, эмпатия и самодисциплина, которые помогают людям жить в гармонии с социальными нормами. Содействие формированию целостной личности в процессе обучения предполагает комплексный подход, способствующий объединению когнитивного, эмоционального, социального и духовного развития учащихся в интересах обеспечения баланса академических способностей и развития характера. Цель. В исследовании анализируются мировые тенденции влияния целостных моделей образования на становление характера развивающейся личности. Методология, методы и методики. Методологической основой исследования стал систематический подход к обзору результатов теоретических и эмпирических исследований в авторитетных международных журналах, индексируемых Scopus, в период с 2016 по 2024 год по обозначенной проблематике. Анализ данных проводился с использованием библиометрического приложения Biblioshiny (RStudio) и программного пакета для качественного анализа данных NVivo. Результаты исследования показывают, что целостное образование положительно влияет на формирование нравственного поведения и улучшает результаты обучения учащихся. Отмечается, что интеграция элементов воспитательного характера в формальные учебные программы и методы обучения, которые отдают приоритет контекстному опыту и саморефлексии, усиливает способность учащихся критически мыслить, сотрудничать и решать проблемы. Научная новизна. Согласно исследованию, включение моделей целостного обучения и воспитания нравственных черт характера в одну концептуальную структуру свидетельствует о том, что моральное и академическое развитие личности могут усиливать друг друга. Практическая значимость заключается в выработке рекомендаций для разработки целостных учебных программ и стратегий, которые способствуют достижению высоких академических результатов и развитию нравственных черт характера у учащихся как ответственных граждан своей страны.

Ключевые слова: академические способности, модели обучения, развивающаяся личность, становление характера, целостное образование

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Introduction

A. A. Assi explained that character education systematically educates individuals in developing values and attitudes that underlie moral and ethical behaviour [1]. I. Arifin also stated that that character education will make it easier for students to understand and apply principles such as honesty, responsibility, empathy, and co-operation in daily life [2]. This approach focuses on the formation of a balanced and integrative personality, connecting the cognitive, affective, and conative aspects of individual development. R. I. Setyowati, M. Hayeemaming and A. M. Shofwan support the opinion by noting that character education plays an important role in creating a more harmonious individual and just society because it instills fundamental values that guide individual actions in a social and cultural context [3]. This is also supported by the opinion of L. Kurniati, A. V. Qori'ah and I. A. Wulandari, who state that character education will form a person who is not only academically intelligent but also has moral integrity and social awareness [4].

In a global context, S. S. Rangkuti, Z. Zulhimma and Z. Zulhammi explained that character education has a profound meaning because it serves as a foundation to form individuals who are not only technically competent but also ethical and competitive on the world stage [5]. With an increasingly connected and diverse society, N. T. Pimpalkar noted that character values such as tolerance, empathy, and social justice are increasingly important in facilitating harmonious and constructive intercultural interactions [6]. According to S. Linder, R. Jörg and H. Ziemainz, character education equips individuals to understand and appreciate differences and contribute to inclusive and sustainable solutions to global challenges [7]. Moreover, H. A. Pitaloka explained that through an emphasis on social responsibility and sustainability, character education prepares future generations to face global issues such as climate change, inequality, and international conflicts with a proactive and ethical attitude [8]. S. Z. Allison argues that by instilling universal values that support justice and solidarity, character education plays a key role in creating a more just and peaceful world where individuals function as good citizens and responsible members of the global community [9].

E. Laiuluy explained that education character plays a central role in shaping individuals of noble character by aligning their moral and ethical development with the universal principles of goodness [10]. This process involves more than just teaching values; M. Miratunnisah thinks this also involves the formation of habits and attitudes consistent with high moral norms [11]. H. Newman argues that through active and reflective learning, individuals are encouraged to internalise honesty, integrity, and empathy and apply these values in their lives [12]. A. S. Manurung, A. Halim and A. Rosyid explain that character education creates an environment in which individuals learn to evaluate their decisions based on ethical considerations and their impact on others [13]. A. W. Ritonga also supported this opinion through hands-on experience, moral discussions, and practical exercises, students learn theories about right and wrong and are trained to face ethical dilemmas with

wisdom and courage [14]. Thus, character education contributes to the formation of a personality that has deep knowledge and commitment to moral principles, which ultimately leads them to become individuals of noble character and contribute positively to society [15].

According to Marsini, character education is very relevant in facing global challenges since individuals with a strong moral foundation and social skills need to cope with the complexities of the modern world [16]. Global challenges such as climate change, social injustice, and international conflicts require solutions that are not only technical but also ethical [17]. M. S. Alazmi and A.A. Alazmi explained that character education teaches values such as responsibility, concern for the environment, and solidarity, which are important in responding to these issues effectively [18]. By cultivating individuals who recognise the impact of their actions on society and the planet, character education empowers them to become responsible agents of change. For example, empathy and cooperation instilled through character education can help to overcome cross-cultural tensions and build constructive dialogue. Additionally, character education strengthens an individual's commitment to participate in sustainable and ethical solutions by emphasising the importance of integrity and justice. In an increasingly connected and dynamic global context, H. Bishara argues that character education provides a moral foundation that supports the development of a more just and harmonious society and facilitates cross-border cooperation to overcome common challenges [19].

The global education trend is shifting towards a more inclusive and holistic approach, emphasising the development of 21st century skills and social and emotional values [20]. With the advancement of technology and globalisation, A. P. Yilmaz explained that educational curricula increasingly integrate digital skills, critical thinking, and adaptability, which are essential for navigating a rapidly changing world [21]. In addition, there is a strong push for education based on diversity and inclusion, which reflects an awareness of the importance of understanding and valuing different perspectives. According to P. Sahlberg, character education also gets more attention, with a focus on developing ethics and moral values as an integral part of the learning process [22]. More connected learning models, such as project-based and experiential learning, are growing in popularity because they promote active engagement and application of knowledge in real-world contexts [23]. This trend also emphasises students' mental health and well-being, which is essential for supporting academic achievement and a balanced life. Global education trends aim to prepare future generations for success in an increasingly complex and interdependent environment by prioritising a holistic and future-oriented approach.

The paradigm shift in education in various countries has become an inevitable trend in recent decades. Driven by globalisation, technological revolution, and changing demands of the world of work, education systems in various parts of the world have undergone significant transformations [24]. For example, the 2022 PISA (Programme for International Student Assessment) report shows an uneven distribution of PISA scores, and many countries still have PISA scores below the OECD average, which is 472 points.

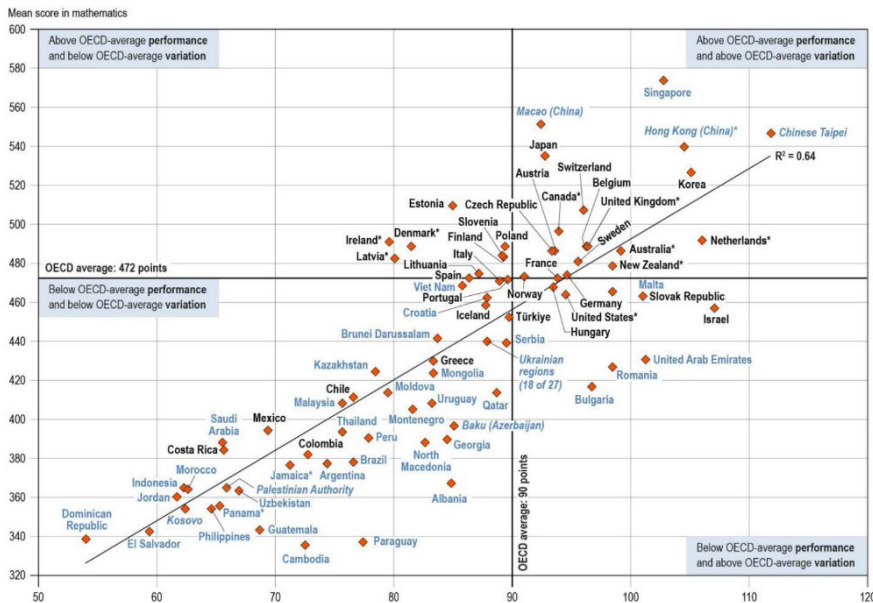


Fig. 1. Pisa scores by country, 2022

From the existing data, it is necessary to strengthen new trends to improve the quality of education in various countries. On the other hand, data from UNESCO shows that many developing countries still face challenges related to the accessibility of education, the quality of teachers, and the relevance of the curriculum to the needs of the job market. This paradigm shift has also sparked a fierce debate about the role of technology in education with the emergence of online learning models, adaptive learning, and artificial intelligence. However, challenges such as the digital divide and lack of adequate infrastructure remain barriers to implementing educational technology in many countries.

A. Shahzad explained that globalisation has had a major and diverse impact on education systems around the world, creating significant opportunities and challenges [25]. On the one hand, globalisation facilitates greater access to educational and technological resources, allowing educational institutions to adopt more diverse and innovative curricula and access teaching materials and methods from different parts of the world. It also encourages the adoption of international education standards that can improve the quality and equality of education. However, globalisation also poses challenges such as cultural homogenisation and unequal access. Curricula and educational methods dominated by Western perspectives can threaten the diversity of local cultures and traditional educational values. In addition, there are concerns about the gap between developed and developing countries regarding access to technology and quality education. The results were supported by J. Varsava, who explained that globalisation is also affecting higher education with increasing academic mobility and the need to prepare graduates who can compete

in the global job market [26]. The education system must balance global integration and preserve local cultural identity while ensuring all students have equal educational opportunities.

Literature Review

Character Education

According to K. S. Taber, education is an important process that holistically shapes and develops an individual's potential, encompassing intellectual, emotional, moral, and social aspects [27]. More than just knowledge transfer, D.A. Pradana, M. Mahfud, C. Hermawan et al. argue that education also plays a role in developing critical thinking skills, shaping moral character, and preparing individuals to play an active role in society [28]. W. Bao also stated that education is also a means to pass on cultural values and social norms from one generation to the next, creating a civilised and harmonious society [29]. Moreover, G. Cooper explains that education is a lifelong process that is not limited to formal education but also includes learning in the family, community, and workplace environment [30]. C. K. Y. Chan and W. Hu explained that through education, individuals acquire the skills needed to live independently and develop a sense of responsibility for personal and social well-being in order to face global challenges wisely and responsively [31].

The term "character" can refer to a variety of entities depending on the context. According to G. P. Goodwin, J. Piazza, P. Rozin, in literary discourse, "character" is understood as a theoretical construct involved with self-modelling, especially during the early modern period [32]. This concept emphasises that characters are not just narrative elements but complex interactions between identity and theory, in which characters can reflect and challenge theoretical formulations of language and self [33]. Additionally, H. Herrmann and H. Bucksch, backed up the statement by stating that character encompasses traits and qualities that define an individual's personality, which can influence their actions and decisions in the narrative [34]. H. Y. Ling, F. Zinno and G. Cheng et al. also explained that character development throughout the story often involves challenges that lead to growth, making it a dynamic process that is central to narrative development [35]. In a broader context, N. Mukunda argues that character can also refer to the moral and psychological attributes that individuals develop, which are essential for personal development and ethical behaviour [36]. Thus, N. S. Schutte and J. M. Malouff also stated that characters serve as multifaceted concepts that integrate theoretical, narrative, and moral dimensions, shaping individual identities and the stories they inhabit [37].

M. M. Nainggolan and L. Naibaho argue that character education is an important foundation to form individuals who excel intellectually, morally, and with integrity [38]. This opinion was supported by P. Setoh and M. Cheng, who explained educational objectives to develop noble values such as honesty, sense of responsibility, cooperation, empathy, and self-discipline, which are the basis of positive behaviour in daily life [39]. In this context, Sarkadi, A. R. Casmana, C. J. Hisyam et al. noted that character education focuses on cognitive or academic aspects and emphasises affec-

tive and behavioural development [40]. M. Maisyaroh, S. Untari, T. Chusniyah et al. also stated that through character education, individuals are invited to understand and internalise the ethical norms that apply in society to make wise decisions, act fairly, and uphold human values [41].

The process of character education does not only take place in the classroom but involves the family, school, and community environment as important agents who play a role in shaping behaviour [14]. A holistic approach to character education can be done through hands-on learning methods, setting an example by educators and parents, and creating a positive school culture. J. Baehr states that by instilling character values from an early age, it is hoped that individuals will not only be able to excel academically but also become responsible citizens, care for others, and ready to contribute positively to social development [42].

Holistic Learning

C. Shorten and T. M. Khoshgoftaar argue that learning is a dynamic process that involves the acquisition of knowledge, skills, values, and attitudes through experience, education, or training [43]. M. Abadi, A. Chu, I. Goodfellow et al. support this opinion by stating that this process is not limited to formal classrooms but covers all aspects of life in both academic and non-academic environments [44]. Learning can occur through interaction, observation of the surrounding environment, and self-reflection [45]. In formal education, S. Dhawan explained that learning is typically guided by a teacher or facilitator, who provides direction, materials, and guidance to help students understand certain concepts. However, learning can also be self-reliant, where individuals can explore new topics and deepen their knowledge independently [46]. F. Sohil, M. U. Sohali and J. Shabbir stated that effective learning involves a variety of methods, such as discussion, problem-solving, case studies, and project-based learning, designed to allow for hands-on student engagement [47]. It aims to memorise information and develop critical thinking skills, creativity, and the ability to apply knowledge in real-life situations. Learning is also influenced by motivation, experiences, and a supportive environment, where students are encouraged to constantly evolve and adapt to the changes around them. M. I. Jordan and T. M. Mitchell support this opinion by stating that this lifelong learning process is an important foundation to face the challenges of a rapidly evolving and changing world [48].

According to S. Koul and B. Nayar, holistic learning is an educational approach that focuses on the holistic development of each aspect of an individual, including cognitive, emotional, social, physical, and spiritual aspects [49]. J. Liu, G. Wu, J. Luan et al. also stated that this approach sees students as whole beings who need mastery of academic material and an understanding of themselves, their relationships with others, and their role in society and the world [50]. In holistic learning, the ultimate goal is to achieve academic success and foster a sense of responsibility, creativity, empathy, and the ability to think critically and solve problems independently [51]. According to R. Yousef, G. Gupta, N. Yousef et al., this approach encourages active student engagement in learning by integrating real-world experiences and emphasising contextually relevant learning [52]. Moreover, D. Chronéer and F. Backlund explained that holistic learning balances intellectual and emotional development

and a harmonious relationship with the environment. This approach often involves activities that encourage self-exploration, collaboration, reflection, and interaction with the surrounding environment so that students not only learn to “know” but also to “become” and “act” according to the values learned [53].

Methodology, Materials, and Methods

Research Design

The research design used in this study is Systematic Literature Review. The research design of the Systematic Literature Review (SLR) aims to systematically identify, evaluate, and synthesise relevant literature in a specific research field [54]. L. A. Novopashina, E. G. Grigorieva, N. F. Ilyina et al. explained that the SLR research process begins by formulating clear and specific research questions, followed by the preparation of inclusion and exclusion criteria to select appropriate studies [55]. Furthermore, E. M. B. Mondragón, G. A. Q. Castro, M. d. P. Q. Castro et al. conducted a comprehensive literature search in various academic databases to collect relevant articles and publications [56]. The selection process is carried out carefully, including assessing the quality and relevance of the research found. Data from studies that met the criteria were systematically analysed to identify patterns, findings, and gaps in the literature. Finally, the results of the synthesis are presented in summaries and in-depth analysis, providing clearer insights into the research topic and further research directions [57]. In this study, the design of the Systematic Literature Review (SLR) was applied to analyse global trends in character education and holistic learning models.

Literature Selection Criteria

In this study, specific inclusion and exclusion criteria were used to ensure the selection of relevant and quality studies [58]. Articles included in the analysis must be published in the last nine years (2016–2024) and indexed in Scopus. The selected articles are also only those that directly address topics related to global trends in character education and holistic learning models. In contrast, articles that are irrelevant or published prior to that period will be excluded. In addition, the primary focus will be on empirical, theoretical, or systematic review studies published in the United Kingdom. We only analysed articles published in the United Kingdom to ensure data quality and consistency of analysis. Although the main focus is on articles published in the United Kingdom, the study also includes articles from other countries indexed by Scopus, including Indonesia, to provide a broader and contextual perspective. The addition of articles from Indonesia aims to illustrate local contributions to the development of character education at the global level, covering cultural values and unique approaches that are relevant to the local context. This section is expanded to explain how the approach affects the validity of findings and their relevance to the global context.

In contrast, non-academic articles published in other languages without adequate translation sources will be excluded. This research aims to provide an in-depth and up-to-date synthesis of the topics studied. The following is a detailed breakdown of the inclusion criteria and exclusions of this study.

Table 1

Inclusion and exclusion criteria

Criterion	Inclusion	Exception
Time range	Articles published in the last nine years (e.g. 2016–2024).	Articles published before the last nine years (for example, before 2016).
Source	Articles published in indexed journals in Scopus.	Articles published in journals that are not indexed in Scopus or non-academic sources.
Topic relevance	An article that discusses global trends in character education and holistic learning models.	Articles that are irrelevant to global trends in character education or holistic or overly general learning models.
Type of study	A study that is an empirical, theoretical, or systematic review that is relevant to the research topic.	Studies that are non-academic, such as opinion articles, editorials, or non-systematic reviews.
Language	The article is published in English.	Articles are published in languages other than English without adequate resources for accurate translation.

Data Collection Process

The data collection process begins by conducting a literature search in the Scopus database. This search focuses on relevant topics using the keywords: trends, global, education, character, models, learning, and holistic. This filter is applied to limit the results of articles published in the last nine years, i.e. between 2016 and 2024. Once the search results are obtained, the bibliometric data is exported to a compatible format, such as CSV or BibTeX. The exported data includes important information, such as the title of the article, the author's name, the abstract, the year of publication, the journal in which the article was published, and the number of citations. This data was then further analysed to gain insight into research trends on the topics investigated in this study. The following is the data collection and selection process carried out in this study:

Table 2

Research data collection process

Component	Information	Information
Identification	Data found and indexed by Scopus as many as ($N = 123$ articles)	Data on articles whose components do not meet the requirements are seen from the field of study ($N = 15$)
Screening	Residue filtered data ($N = 108$)	Articles that exceed the predetermined year limit, namely 2016-2024 ($N = 15$)
	Remaining articles ($N = 93$)	Articles that are not part of scientific articles such as books, reports as many as ($N = 15$)
	Qualifying artifacts ($N = 77$)	Non-English articles ($N = 7$)
	Remaining articles ($N = 70$)	Articles that do not match the keywords and fields of study ($N = 52$)
Insert	Data worth reviewing ($N = 18$)	

Table 2 shows 18 articles that are the source in this study. The selected articles directly address the topics of character education and holistic learning, while other references are used as theoretical support or additional context. The analysed articles include research from various countries, including Indonesia, to provide a global and local perspective. The article from Indonesia highlights a cultural and religious-based approach to character education, which provides a unique dimension in the analysis. The selected articles have clear methodologies and in-depth empirical data, allowing us to explore the findings more comprehensively. Only articles published in highly reputable journals indexed by Scopus are eligible to ensure the integrity and validity of the results.

Data Analysis

In this study, data analysis was conducted using Biblioshiny and NVivo to provide an in-depth understanding of global trends in character education and holistic learning models. First, bibliometric data is collected from selected articles using Biblioshiny, the web interface of the Bibliometric tool in R. This process involves collecting data from sources indexed in Scopus and exporting it in a compatible format. With Biblioshiny, descriptive analysis was carried out to obtain statistics on the number of publications, the distribution of authors, and related journals. Furthermore, bibliometric performance analysis is conducted to identify influential authors and publication trends through visualisations such as shared citation maps and trend graphs. Keyword frequency analysis is also carried out to uncover the main themes that are often discussed. Text data from articles and abstracts are imported into NVivo for qualitative analysis. In NVivo, texts are coded based on relevant themes and categories, such as character education trends and challenges faced. Thematic analysis is carried out to identify and understand the main themes, as well as the relationships between them. The results from NVivo, which include diagrams and concept maps, are utilised to visually illustrate patterns and relationships among themes. Integrating the findings of bibliometric and qualitative analysis resulted in a thorough synthesis of global trends and holistic learning models in character education. The results are presented by combining visualisations from both tools to support the research arguments and findings, providing comprehensive insights into the latest developments in the field.

Results

Global Trends in Education

The results of the analysis of global trends in the field of education show that data from 2016 to 2024 show results as shown in Figure 2.

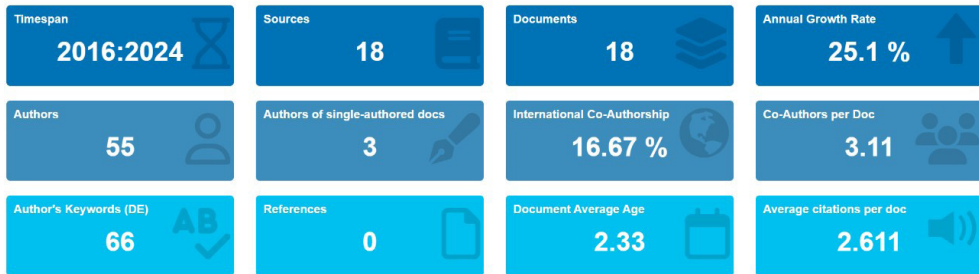


Fig. 2. Composition of research data

Figure 2 above presents a bibliometric summary of the literature analysis conducted within the time frame of 2016 to 2024. There are 18 documents from 18 sources, with 55 authors involved in the study. As many as 16.67% of these documents involved international cooperation, and there were an average of 3.11 authors per document, while one author wrote three documents. The annual growth rate for this publication stands at 25.1%, indicating a significant increase in the number of works published. In addition, the author uses 66 keywords in this publication. The analysed documents had an average age of 2.33 years, with an average of 2,611 citations per document, which reflects the influence of the study on the period analysed. However, there are no references directly attributed to this metric, which could provide room for further investigation into the distribution of citations in the literature used. If we examine the productivity levels year by year, the following Figure 3 illustrates the preliminary trends.

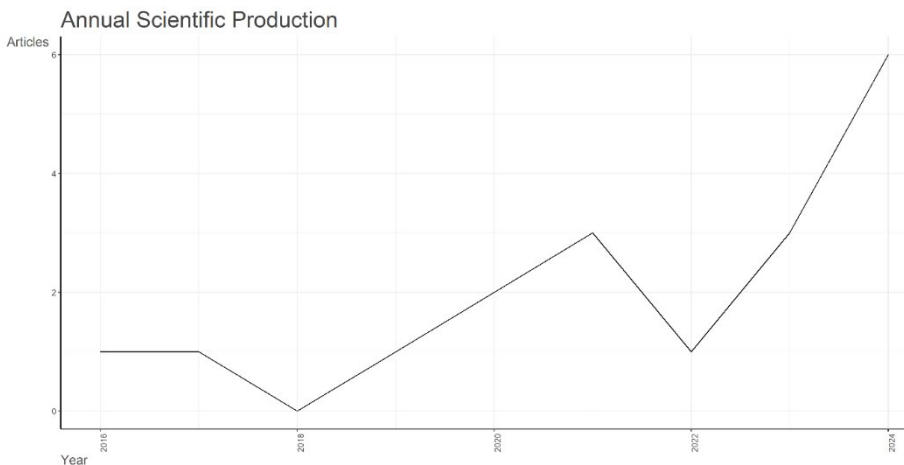


Fig. 3. Scientific production chart every year

Figure 3 above shows the annual scientific production of articles related to character education and holistic learning models from 2016 to 2024. It can be seen that the number of articles published fluctuated throughout the period. In 2016, one article was published, but there was a drastic decline in 2018, with no publications detected. 2020 marked a significant increase in publications with two articles, followed by a decline in 2022. However, scientific production experienced a significant increase from 2023 to 2024, with the number of articles rising to six in the past year. This surge indicates that interest in character education and holistic learning models increased substantially at the end of the period analysed. The sharp increase in publications could reflect the growing importance of this topic amid the global challenges faced by the education sector. This sharp increase in publications is in line with an annual growth rate of 25.1%, as shown in the previous metric, and reinforces the growing attention to this topic in academic research.

The citation rate per year is also increasing. Figure 4 shows the average citations for each year:

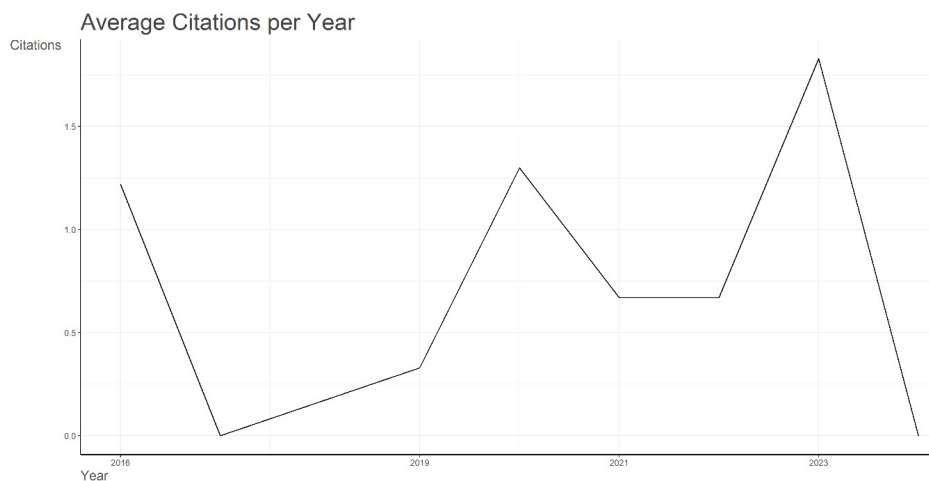


Fig. 4. Average citation graph per year

Based on the chart, significant year-over-year average fluctuations in citations are evident, with a peak in 2016, followed by a sharp decline in 2017, and then gradually increasing through 2023. These fluctuations are likely due to changes in research trends, with new topics attracting more attention so that older research gets fewer citations. Other factors, such as changes in methodology, accessibility of publications, or citation policies, can also play a role. These fluctuations suggest that the impact of research is not always stable, so we and institutions need to keep up with trends, update methodologies, and increase publication visibility through strategies such as collaboration with publishers or the use of open access platforms.

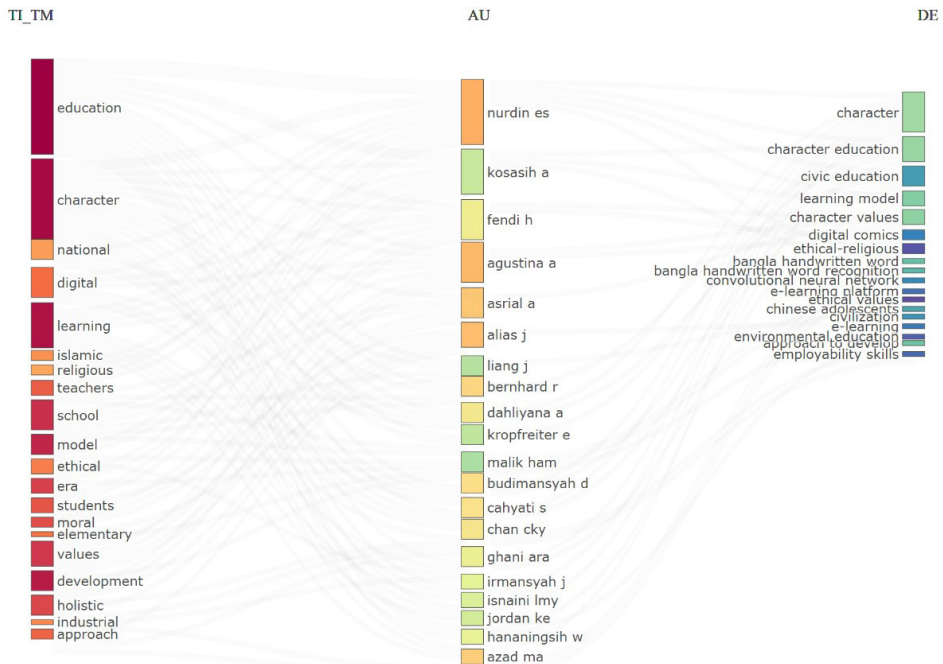


Fig. 5. Concept map of relationships in research

The concept map presented illustrates the relationship between various concepts related to character education, with some key findings. Character education emerges as a major focus that connects various other concepts, reflecting its role as the core of various aspects of Education. This concept is intertwined with moral values, ethics, and context-based learning, demonstrating that character education is not an isolated endeavour but is closely linked to a holistic approach. The close relationship with national education shows the importance of integrating learning methods that not only focus on academic aspects but also on the moral and social development of students. Values such as empathy, responsibility, and cooperation are shown as mutually reinforcing components. The map also illustrates the linkages with various learning models, such as holistic and character-based models, showing that character education can be integrated in a variety of approaches. In addition, moral, ethical, and religious values play an important role in character education, emphasising the goal of instilling positive values in students. The role of teachers and schools is also very significant, showing that the success of character education is highly dependent on the quality of teaching and a supportive school environment. Teachers are not only responsible for delivering material but also being role models in shaping positive values in students. Character education must be integrated

with all aspects of education, with the development of effective learning models and adequate teacher training. In addition, schools need to create an environment that supports the growth of students' character through extracurricular programmes and value-based activities. Concepts such as “religion” and “local context” reflect the importance of adapting character education to local cultural values. This can be seen in the contribution of an article from Indonesia that emphasises the importance of cultural and religious-based education. This conceptual map reinforces the argument that character education can improve student learning outcomes, both academically and in moral development. These findings lead to recommendations for designing a more holistic curriculum that focuses on character values.

Research Trend Productivity

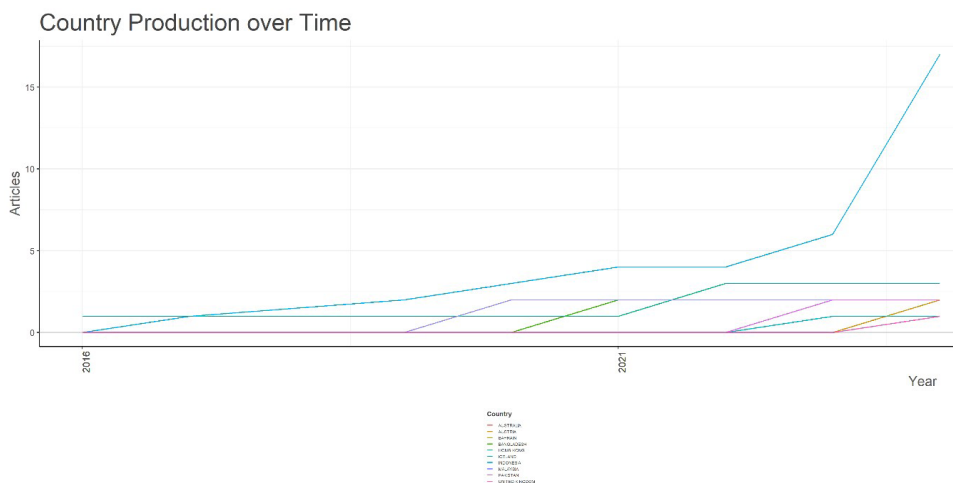


Fig. 6. Publication productivity in different countries each year

The graph analysis “Country Production over Time” shows a significant upward trend in the number of articles published by different countries between 2016 and 2021, which shows an increase in research activity globally. All countries generally experienced increased productivity, but the growth rates varied, suggesting differences in research priorities, government support, and research capacity. In addition, the graph reveals a pattern of collaboration between countries characterised by the same growth, which shows the existence of international research cooperation. Technological advances and globalisation are likely to influence the increase in global interest in this research, while the differences in capacity between countries reflect variations in funding, infrastructure, and human resources. The surge in publication productivity shows the increasing awareness and attention to the importance of character education in facing global challenges such as social change and

technological developments. International collaboration plays a crucial role in accelerating innovation and addressing global challenges. This graph shows a pattern of collaboration between countries, reflecting the importance of sharing knowledge across borders. This article is used to highlight the need for global synergy in character education research. This graph also shows that developing countries, including Indonesia, are starting to increase their research productivity, which provides a local perspective on global trends. The article from Indonesia emphasises cultural and religious values as a unique approach to character education. The implications of these findings highlight the necessity of developing more effective research policies, expanding international partnerships, and utilising these results to assess the performance of each country's research system, thereby identifying areas for improvement. Increasing publication productivity provides a stronger foundation for policymakers to design more inclusive and holistic curricula.

Research Topic Trends



Fig. 7. Word cloud analysis on education trends

The word cloud analysis shown in Figure 7 illustrates that the frequency of the occurrence of the main words in the research is related to character education and holistic learning. The analysis of word clouds on character education revealed that the main focus of this research is the development of students' character, with the dominance of words such as "character", "values", "morals", and "ethics", which shows the importance of forming moral individuals in addition to academic intelligence. A holistic approach is also a key theme, emphasising the development of cognitive, affective, and psychomotor aspects of students. In addition, the role of technology in character education can be seen from the emergence of words such as "digital" and "e-learning", which indicates the integration of technology in learning. The cultural and social context, which is reflected in words such as "Bangladesh", "Islam", and "culture", highlights the need to tailor character education to the values of the local community. The implications of these findings include the potential for the formulation of educational policies, the preparation of a curriculum that supports character development, the development of more effective learning methods, and the importance of teacher training. Further research is needed to measure student character development, address implementation challenges, and promote collaboration between schools, families, and communities in student character development.

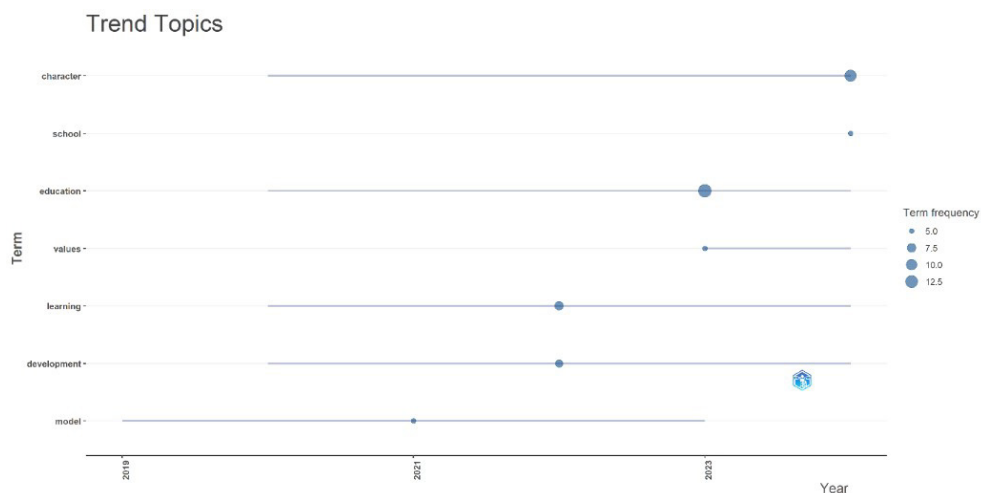


Fig. 8. Research topic trends

Figure 8 presents a data analysis that shows the distribution of research trends related to character education and holistic learning in the form of graphs or visual tables. Key findings show a consistent upward trend in the use of keywords such as “character”, “value”, “education”, “learning”, and “development”, indicating an increasing interest in character education research. Despite the increase in frequency, key themes such as character, values, and learning have remained stable, signaling that the research focuses on individual character development. New keywords such as “model” are starting to emerge, reflecting efforts to develop new frameworks in character education. The interpretation of these findings shows an increased awareness of the importance of forming an academically intelligent young generation with strong moral values. In addition, the emergence of the word “model” signifies the development of research aimed at measuring and improving the character of students in particular. This growing interest may be driven by contemporary social changes and increasingly complex global challenges. The implications of these findings include the potential to formulate educational policies that focus more on character development and the development of curricula and programmes in schools that support character education. These graphs can help us to identify gaps and formulate more specific research questions.

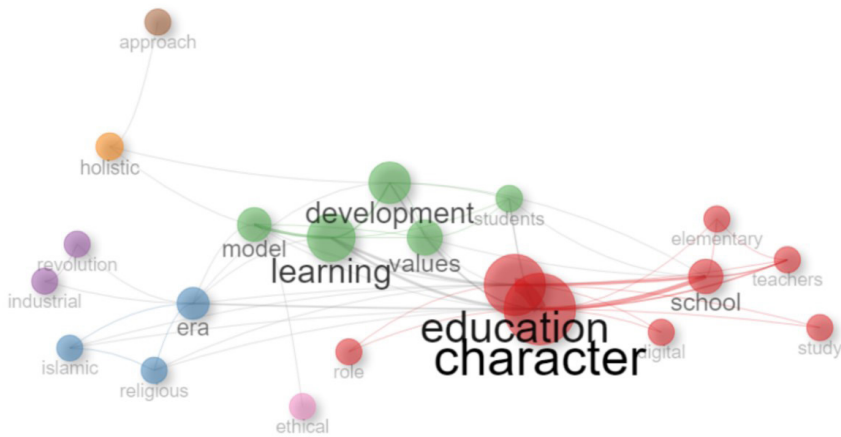


Fig. 9. Relationship between research themes

The main findings suggest that “character” and “education” are at the centre of the network, pointing to both as key concepts in the study. The conceptual relationship between words such as “value”, “learning”, “development”, and “student” with “character” and “education” shows a close and mutually influencing relationship. In addition, the network covers related themes such as “holistic”, “model”, “era”, “religion”, and “school”, reflecting the breadth of aspects and perspectives in character education research. This network interpretation confirms that character education is the main focus, with a holistic approach that includes cognitive, affective, and psychomotor aspects. Formal education plays an important role in developing students’ character through schools and teachers. At the same time, cultural and religious contexts are also considered, as seen in words such as “religion” and “Islam”. The implications of these findings include the formulation of educational policies that focus more on character development, the development of a curriculum that supports value-based learning, and the importance of teacher training to carry out character education. The network can also guide further research by identifying gaps in character education research and formulating more specific questions.

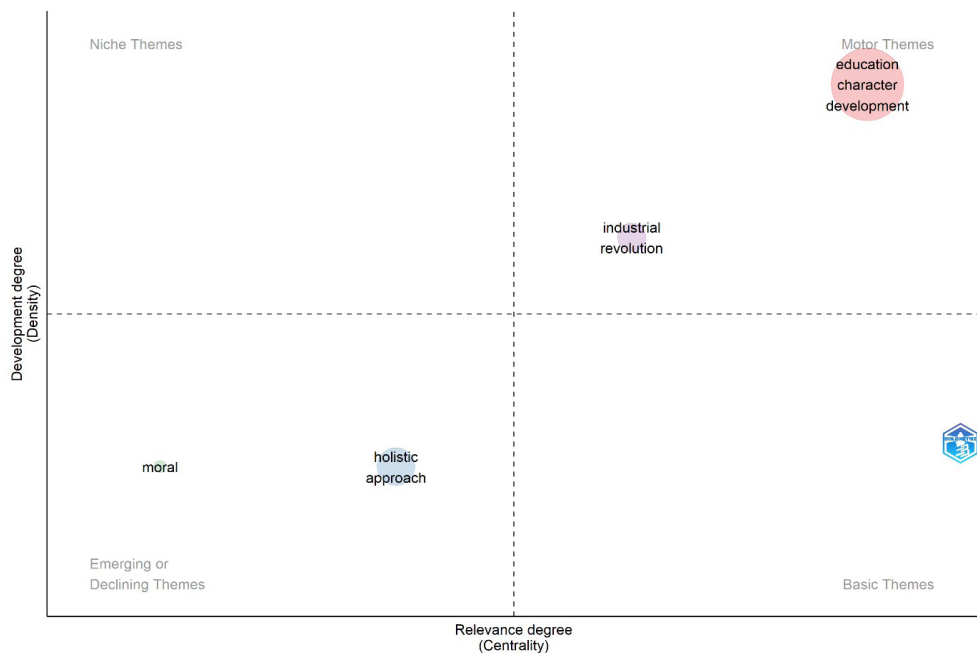


Fig. 10. Development of research themes

Key findings suggest that “character education” is at the center of the map, confirming its position as a major theme in the research, with related concepts such as “character”, “learning”, “development”, and “value” frequently discussed. More specific or less discussed themes, such as “morals” and “holistic approaches”, are in the “special themes” area, while the “industrial revolution” theme is in the area of themes that may appear or decrease in relevance. The interpretation of this map shows that character education remains the main focus of the research, with the adoption of a holistic approach that includes cognitive, affective, and psychomotor aspects. In addition, the development of the theme of “industrial revolution” indicates a change in the focus of research, which can reflect the latest social or technological developments. The implications of this map include the potential to formulate educational policies that focus on developing students’ character, developing a positive value-based curriculum and extracurricular activities, as well as being a guide for us to find gaps in character education research and formulate more specific research questions.

Table 3.
Results of article analysis

No	Name	Title	Year	Source	Method	Subject	Result	Implication
1	M. Taufik [59]	Strategic role of Islamic religious education in strengthening character education in the era of the Industrial Revolution 4.0	2020	Jurnal Ilmiah Islam Futura	Analytical Studies or Literary Studies	Focus on students in the context of Islamic education.	Islamic religious education strengthens students' character and helps them face modern challenges religiously and competitively.	This is expected to produce a generation that is balanced between technical skills and moral character.
2	W. Z. Wan Hassan, J. Alias, N. Muslim, N. Mat [60]	The Inculcation of Civilizational Values as the Medium towards the Holistic Development in Malaysia in the Era of Industrial Revolution 4.0	2020	Universal Journal of Educational Research	Quantitative research with online questionnaires	Students who take TITAS courses at UKM.	The TITAS programme effectively instills high civilisational values in students, helping them face globalisation.	Able to contribute to the development of human resources in a holistic and civilised manner in Malaysia.
3	A. Muhammad, M. A. Malik, H. A. M. Malik [61]	Inculcating Ethical and Moral Values amongst the E-Learners: Proposing a Model for E-Learning Platforms	2023	European Journal of Educational Research	Research with the Delphi method	Fifty-nine members were involved in two rounds.	This model integrates academic institutions, communities, teachers, and e-learning content to instill moral and ethical values.	This model helps create awareness and value formation in e-learners in the digital environment.
4	H. Fendi, H. E. Thahar [62]	Development of Digital Comics-Based Learning Materials Incorporating Local Wisdom and Character Values in Indonesian Language Education for Junior High School Students	2024	Evolutionary Studies in Imaginary Culture	Quasi-experiments with pre-test and post-test, using a control group	Three hundred and eleven junior high school students in West Sumatra (120 experiments, 191 controls).	Minangkabau folklore digital comics improved students' reading interest, language skills, and character scores compared to the control group.	Culture-based digital comics are effective in enriching Indonesian learning and supporting student development.
5	M. A. Azad, H. S. Singha, M. M. H. Nahid [63]	Zilla-64: A Bangla Handwritten Word Dataset Of 64 Districts' Name of Bangladesh and Recognition Using Holistic Approach	2021	2021 International Conference on Contemporary Science and Technology, ICSCST 2021	Development of a new dataset and application of the Deep Convolutional Neural Network (DCNN) method	Bangla's new handwritten dataset is named «Zilla-64».	DCNN is applied to the Zilla-64 dataset with an accuracy of 93.30%.	This dataset is important for research on gender, age, and education-related handwriting recognition, as well as for developing deep learning models.

No	Name	Title	Year	Source	Method	Subject	Result	Implication
6	V. Huaningsia, I. M. Asnaini, C. Armancia [64]	The Role of Traditional Sports in Establishing Student Character through Physical Education, Sports, and Health Learning	2024	International Journal of Human Movement and Sport Science	Qualitative descriptive research with a literature study approach	Focus on students in the context of physical education, sports, and health.	Traditional sports games play an important role in shaping students' character, such as responsibility, cooperation, honesty, and integrity	Traditional sports are effective in character education for students through physical education learning.
7	H. Sabil, J. Ryan [65]	Science teacher's book: analyzing elementary school students' character values	2024	Scientific Journal of Applied Sciences, University of Jambi	Qualitative study with document study method	Science Teacher Book Class IV Independent Curriculum for Elementary School Students.	It was found that there was a deficiency in the representation of important character values in textbooks, which could hinder students' academic, social, and emotional development.	This research calls for increasing the integration of character values in the curriculum to support student development.
8	C. K. Y. Chan, L. H. Y. Tsi, N. C. I. Yeung [66]	An adapted 3P (precursor-process-product) framework for the development of holistic competencies – "Approach to develop" in out of classroom learning	2022	Studies in Educational Evaluation	Testing the conceptual model uses self-report measurements	207 students as participants.	This model shows that students' character and perception affect the development of competencies outside the classroom and are important to achieve holistic competencies.	The approach to competency development outside the classroom is important to enrich students' learning and skills.
9	A. Dahliyana, D. Budimansyah, E. S. Nurdin, A. Suryadi, S. Cahyati [67]	Project citizen digital: Civic education strengthen the national defense character?	2024	Kasetsart Journal of Social Sciences	Quantitative research with the ADDIE model (Analyse, Design, Develop, Implement, Evaluate)	Eighty students from the University of Education Indonesia.	The use of Project Citizen Digital shows the difference in the character of student national defense before and after the implementation, with an average increase of 2.95%.	Project Citizen Digital effectively improves the character of national defense in learning Citizenship Education.
10	E. Kropfreiter, R. Bernhard, T. McDermott [68]	Austrian secondary school teachers' views on character education: quantitative insights from mixed methods studies	2024	Journal of Moral Education	Quantitative research as part of a mixed-methods project	Teacher in junior high school in Austria.	Most teachers (94.6%) believe that character education is more important for students aged 10–14 than exam results, but the Austrian education system faces obstacles in implementing a holistic approach.	Teachers consider character-based education important, but the exam-focused Austrian education system hinders a holistic approach.

No	Name	Title	Year	Source	Method	Subject	Result	Implication
11	R. Satyaningsih, M. Satriawan, F. Rakhman [69]	Perception of pre-service elementary school teachers towards education for sustainable development through character education	2024	E3S Web Conference	Descriptive research	142 prospective primary school teachers at a university in Surabaya, Indonesia	Most respondents agreed that character education for sustainable development is important in primary schools, with a focus on attitudes, values, environmental awareness, and social skills.	Character education for sustainable development is considered very important for the development of students in elementary schools.
12	A. Samsul, H. Miftachul, M. Nur Hayati [70]	Developing Akhlak Karimah values through integrative learning model in Madrasah	2023	Journal of Islamic Education	Qualitative with a phenomenological approach and descriptive methods	Madrasah Ibtidaiyah, tsanawiyah, and aliyah in Lombok.	A holistic learning model that integrates moral values into the curriculum based on student needs is developed.	This model effectively instills character values and supports a holistic approach.
13	K. E. Jordan [71]	The intersection of environmental and sustainability education: an instrumental case study	2023	British Journal of Educational Research	Instrumental case studies	Independent schools in Scotland.	There are many meeting points between Environmental Education and Character Education, including school climate, role models, and service learning.	Demonstrate the potential for collaboration and joint practice between ESE and CE and lead to further research.
14	M. S. Syarif, A. R. A. Ghani [72]	The Model of Implementing Character-based Holistic Education in Learning	2017	International Journal of Economic Research	Descriptive-analytical on character-based holistic education strategies	The courses studied are character-based holistic education concepts.	Character-based holistic education focuses on student development by optimising physical, emotional, social, creative, spiritual, and intellectual aspects.	Emphasising the quality of human resources to face the complexity of science and technology through character-based holistic education.
15	A. Trisiana, S. Supeni [73]	Moral value system in Pancasila-based national development: facing the new normal	2021	Journal of Law, Ethics and Regulatory Issues	Qualitative	Qualitative.	Moral values in the Pancasila system help build, develop and improve the quality of education.	The New Normal is a change in new norms that needs to be integrated with Pancasila values for holistic national development.

No	Name	Title	Year	Source	Method	Subject	Result	Implication
16	J. Liang [74]	A revisit of 'moral and character education' subject in junior-high school in China	2016	China Journal of Social Work	Literature review and theoretical discussion	Students in grades 7-9 in junior high schools in China.	Moral education improves the moral competence of adolescents but lacks policy and curriculum evaluation and requires collaboration between teachers, counselors, and policy-makers.	Offer reflections and suggestions to promote moral education and holistic development of adolescents.
17	N. Taja, E. S. Nurdin, A. Kosasih, E. Suresman, T. Supriyadi [75]	Character Education in the Pandemic Era: A Religious Ethical Learning Model through Islamic Education	2021	International Journal of Educational Learning, Teaching and Research	Development of learning models using the ADDIE method	Three hundred and seventy-six students and 45 PAI teachers in West Java.	The PAI learning model focuses on religious ethical values as a goal, through knowledge, deeds, and becoming.	This model guides teachers and academics in developing PAI design research and character education in the pandemic era.
18	D. Rosana, D. Setyawamo, W. Setyaningsih [76]	Development model of students' inert-depend strategies to face disruption era through best practice film of Android based learning of Pancasila character value	2019	Journal of Physics: Conference Series	Research and Development (R&D) using the 4-D model (Define, Design, Develop, Disseminate)	Students in the school environment.	The development of an inner-dependency strategy through an Android learning film about the character of Pancasila increased the number of students in the experimental class with a "high" average acquisition standard compared to the control class.	This model has the potential to increase students' innate dependency strategies in facing the era of disruption and support the development of Pancasila character in education.

The results of the study show that diverse approaches in education are very important to strengthen students' character and competence in the modern era. Religious education, for example, has been shown to help strengthen students' character, preparing them to face challenges with religious and competitive values. In addition, civilization education programmes can instill noble values and contribute to the development of holistic human resources. In the realm of e-learning, the integration model between academic institutions and digital learning content has succeeded in supporting the cultivation of moral and ethical values for e-learners. The study also revealed that creative media, such as culture-based digital comics, can increase students' interest in reading, language skills, and character values. Educational methods incorporate traditional elements, such as traditional sports, and shape students' character through responsibility and cooperation. However, other findings show that there are still deficiencies in the representation of character values in textbooks, which indicates the need to improve the character education curriculum.

Character development is also influenced by activities outside the classroom, with a digital learning model that can strengthen national character in civic education. At the global level, research shows that character education is valued more by educators than exam results, although exam-based education systems can hinder the application of holistic approaches. Character education that focuses on sustainable development in primary schools is also important, while other holistic learning models instill good moral values. This research emphasises the importance of integrating character education and value-based learning in the curriculum and collaboration between various fields, such as environmental education, to support the development of students' overall character.

Discussion

An analysis of global trends in education from 2016 to 2024 shows a significant increase in publications related to character education and holistic learning models. Bibliometric data reveals that there are 18 documents produced by 55 authors, with international contributions reaching 16.67%. The increase in the annual growth rate of 25.1% indicates the increasing interest in this topic, which is in line with the challenges of education in the modern era. The fluctuation in the number of publications shows an interesting dynamic, with a significant surge occurring in 2023–2024. This phenomenon can be interpreted as a response to the increasingly urgent need to develop individuals who are not only academically intelligent but also have strong character in the midst of the complexity of global challenges. Fluctuating citation patterns suggest that not all studies maintain their relevance over time. These fluctuations highlight the importance for institutions to continuously update their methodologies and increase the visibility of their research. Strategies that can be pursued include increasing international collaboration and leveraging open access platforms to expand the reach and impact of research.

The concept map generated from the analysis illustrates the close relationship between character education, moral values, ethics, and various learning models. These findings confirm that student character development requires a holistic approach that involves all aspects of education, from the curriculum to the school environment. The role of teachers and educational institutions is very important in creating an ecosystem that supports the growth of students' character. The analysis reveals a significant pattern of collaboration between countries, indicating strong international support for this study. Although there are variations in the rate of productivity growth between countries, reflecting differences in research capacity and priorities, international cooperation has proven to be a catalyst in accelerating innovation and addressing global challenges in character education. The use of keywords such as "character", "value", and "holistic" in the research reflects a clear focus on student character development. The emergence of the word "model" indicates active efforts to formulate a better framework in character education. These findings confirm that character education is important in the academic context and in shaping individuals who have strong positive values and are ready to face future challenges.

Research by A. Muhammad, M. A. Malik and H. A. M. Malik [61], H. Fendi and H. E. Thahar [62] demonstrated the potential of technology integration in supporting character education. Using e-learning and creative digital media, such as culture-based comics, increases students' interests and skills and effectively instills character values. These results show that technological innovation can bridge the gap between traditional education and the needs of the digital generation. Despite the positive trend, there are still some significant challenges faced in the implementation of character education. H. Sabil and J. Ryan [65] revealed shortcomings in the representation of character values in textbooks, while E. Kropfreiter, R. Bernhard and T. McDermott found that an exam-focused education system can hinder a holistic approach to character development [68]. These findings highlight the need for systemic reforms in education to accommodate character development more effectively. The research conducted by A. Syamsul, H. Miftachul, M. Nur Hayati [70] and K. E. Jordan [71] shows the potential of a multidisciplinary approach to enrich character education. Integrating character education with environmental or religious education opens up opportunities to develop more comprehensive learning models that are relevant to today's global context.

An analysis of global trends in character education and holistic learning models from 2016 to 2024 reveals significant implications for education systems. The growing research interest in this area reflects the urgent need to reform the approach to education, with a surge in publications in 2023–2024 highlighting the importance of integrating character development into the curriculum, thus prompting a review of education policy at the national and international levels. In addition, the strong connections between character education, moral values, and various learning models emphasise the importance of a holistic approach that fosters the comprehensive development of individuals – intellectually, emotionally, and morally. This approach

addresses the tensions identified between examination-oriented education systems and the necessity for more thorough character education. The patterns of international collaboration identified through bibliometric analysis also demonstrate the importance of cross-border knowledge exchange, which opens up opportunities to develop a universal approach to character education but remain sensitive to local cultural contexts, such as through the integration of environmental education. On the other hand, implementation challenges, including the lack of representation of character values in teaching materials, underscore the need for in-depth evaluation of educational resources, including the revision of subject matter and the development of teaching and evaluation methods that support character education effectively. Finally, technological advances in character education have implications for the need for innovation in teaching methods, where the use of interactive and digital media has the potential to enrich character learning, especially for the generation that is increasingly connected to technology, so learning strategies must be digitally relevant while maintaining a focus on character development.

Based on the identified implications, several strategic recommendations are proposed. First, education policy reform is needed to explicitly integrate character development into the curriculum, accompanied by clear implementation guidelines. Collaboration between governments, academics, and practitioners is essential to create a comprehensive framework that can be applied across various educational institutions. Second, significant investment is needed in teacher professional development, including training in methods that support character education, educational technology, and social-emotional learning. Collaboration with higher education institutions and research centers is needed to create evidence-based training programmes that are relevant to local needs. Third, the development and distribution of educational resources that integrate character values are urgently needed, including the revision of textbooks and interactive digital materials. Collaboration between publishers, technology developers, and character education experts can result in innovative and effective resources. Fourth, international research collaboration in character education should be encouraged to accelerate innovation and dissemination of best practices. Building a global network of knowledge-sharing platforms will enrich cross-disciplinary approaches in a variety of cultural contexts. Fifth, a more comprehensive evaluation system to measure not only academic achievement but also character development of students should be implemented, using valid and reliable methods, such as observation rubrics and character development portfolios. Finally, increasing community and family involvement in character education is essential. Educational programmes for parents, partnerships between schools and communities, and service-based learning initiatives can strengthen the consistency of school values with those practiced in the home and community environment.

Conclusion and Recommendations

The conclusions of this study highlight global trends in character education and holistic learning models between 2016 and 2024, with a significant increase in

research interest reflected in the annual publication growth of 25.1%, especially in the 2023–2024 period. Key findings point to a strong relationship between character education, moral values, and various learning models, underscoring the importance of a holistic approach to curriculum development and educational practice. Bibliometric analysis also revealed strong international collaboration, with a global contribution of 16.67%, confirming the important role of cross-border knowledge exchange in building an effective approach to character education. In addition, the potential for technological integration and multidisciplinary approaches was identified as a promising means to enrich the implementation of character education. However, the study also reveals challenges, including a lack of representation of character values in teaching materials and an overemphasis on the exam system, thus emphasising the need for systemic reform in education. These recommendations include reform of education policies, investment in the development of the teaching profession, development of educational resources that are integrated with character values, and the implementation of a comprehensive evaluation system. Increased international research collaboration, community involvement, and the role of the family are important to advance character education. The study provides in-depth insights into the state of character education and its future direction, with major implications for educational practice and policy. Further research is needed to evaluate the long-term effectiveness of character education implementation, develop stronger measurement methodologies for character development, and explore the role of technology in supporting character education in the digital era.

References

1. Assi A.A. Character building in the novel (The Hedgehogs on a Hot Day). *Thi Qar Arts Journal*. 2024;3. doi:10.32792/tqartj.v3i45.560
2. Arifin I. Character building of students in the boarding school system. *International Journal of Scientific Research and Management (IJSRM)*. 2024;12:3436–3443. doi:10.18535/ijssrm/v12i06.el01
3. Setyowati R.I., Hayemaming M., Shofwan A.M. Character building strategy in early childhood. *Bocil Journal: Journal of Childhood Education Development and Parenting*. 2023;1:129–133. doi:10.28926/bocil.v1i3.1166
4. Kurniati L., Qori'ah A.V., Wulandari I.A. Implication of character-building values based on Pancasila learners profile in teaching of the novel "Selemba Itu Berarti" by Suryaman Amipriono in class viii of junior high school. *KnE Social Sciences*. 2023;8:120–133. doi:10.18502/kss.v8i8.13291
5. Rangkuti S.S., Zulhimma Z., Zulhammi Z. Character building in cultural perspective and implementation. *AL-ISHLAH: Jurnal Pendidikan*. 2022;14:4557–4566. doi:10.35445/alishlah.v14i3.2049
6. Pimpalkar N.T. Character building in ECCD. *International Journal for Research in Applied Science and Engineering Technology*. 2023;11:806–811. doi:10.22214/ijraset.2023.51553
7. Linder S., Jörg R., Ziemainz H. "Character is the most important thing in soccer" – a pilot study on the development and effectiveness of a character building program in high-performance youth soccer. *Progress in Physical Education*. 2022;12:217–235. doi:10.4236/ape.2022.123017
8. Pitaloka H.A. Integrating character building in learning of literature using Kentrung's creation in the digital era. *KnE Social Sciences*. 2019;3:419–425. doi:10.18502/kss.v3i10.3925

9. Allison S.Z. Socialization and character education in the Muslim world: exploring the role, impact, and necessity of indoctrination. *IJoReSH: Indonesian Journal of Religion, Spirituality, and Humanity*. 2024;3:76–100. doi:10.18326/ijores.v3i1.76-100
10. Laiuluy E. The role of character education in creating a good generation of the nation. *History: Journal of History and Social Sciences*. 2023;2:122–128. doi:10.58355/historical.v2i3.59
11. Miratunnisah M. Study of literature: the role of traditional games as a learning media to instill character education in elementary school students. *MANDALIKA: Journal of Social Sciences*. 2024;2:13–20. doi:10.56566/mandalika.v2i1.174
12. Newman H. Character [TM]: character writing, drama, and the shape of literary history. *Journal of Modern Cultural Studies Early*. 2021;21:142–177.
13. Manurung A.S., Halim A., Rosyid A. The role of problem-based learning in improving student character education. *Jurnal Basicedu*. 2023;7:169–170. doi:10.31004/basicedu.v7i1.4279
14. Ritonga A.W. Role of teachers and parents in realizing character education in the digital era. *Indonesian Values and Character Education Journal*. 2022;5:9–18. doi:10.23887/ivcej.v5i1.39729
15. Karuniawati, Nadeak B. The effect of character education and the role of teachers on the competency of students in accounting and finance program SMKN 1 Toraja Utara. *International Research Journal-Granthaalayah*. 2021;9:241–247. doi:10.29121/granthaalayah.v9.i2.2021.3525
16. Marsini. The role of social sciences in character education based on Pancasila student profiles. *Morfai Journal*. 2023;2(4):915–926. doi:10.54443/morfai.v2i4.874
17. Sahabuddin E.S., Haling A., Pertiwi N. The development of character strengthening implementation guidelines for students: case research : students of the Faculty of Education, the State University of Makassar. *Klasikal: Journal of Education, Language Teaching and Science*. 2022;4(1):56–67. doi:10.52208/klasikal.v4i1.124
18. Alazmi M.S., Alazmi A.A. The role of administration and faculty in developing character education with in public and private universities in Kuwait. *International Journal of Educational Management*. 2020;34:664–76. doi:10.1108/IJEM-07-2019-0231
19. Bishara H. The main character – the woman in Nawal al-Sa’dawi’s imagination: a well-deserved interactive emotional movement. *Global Academic Journal Linguistics and Literature*. 2022;4:28–48. doi:10.36348/gajll.2022.v04i03.001
20. Isakhova A.S., Duiskenova R.Z.H., Dyusembinova Zh.S., Mishchenko V.V. Foreign practice of global trends in higher education services. *Bulletin of “Turan” University*. 2024;(2):482–495. (In Kazakh) doi:10.46914/1562-2959-2024-1-2-482-495
21. Yilmaz A.P. Trends of global education studies in social studies education: 2000–2023. *Journal of Innovative Research in Teacher Education*. 2023;4(1):77–91. doi:10.29329/jirte.2023.531.5
22. Sahlberg P. Trends in global education reform since the 1990s: looking for the right way. *International Journal of Educational Development*. 2023;98:102748. doi:10.1016/j.ijedudev.2023.102748
23. Hmelo-Silver C.E. Problem-based learning: what and how do students learn? *Educational Psychology Review*. 2004;16(3):235–266. doi:10.1023/B:EDPR.0000034022.16470.f3
24. OECD. English Fact Sheet OECD PISA 2022 Results. OECD 2022. Accessed May 11, 2024. <https://www.oecd.org/publication/pisa-2022-results/country-notes/indonesia-c2e1ae0e/>
25. Shahzad A. What is globalization – historical background. *Jadavpur Journal of International Relations*. 2006;10(1):204–212. doi:10.1177/0973598406110013
26. Varsava J. Globalization. In: O'Donnell P., Burn S.J., Larkin L., eds. *Encyclopedia of Contemporary American Fiction 1980–2020*. John Wiley & Sons, Ltd; 2022:1–11. doi:10.1002/9781119431732.ecaf0242

27. Taber K.S. The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*. 2018;48(1):1273–1296. doi:10.1007/s11165-016-9602-2
28. Pradana D.A., Mahfud M., Hermawan C., Susanti H.D. Nasionalism: character education orientation in learning development. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*. 2021;3:4026–4034. doi:10.33258/birci.v3i4.1501
29. Bao W. COVID-19 and online teaching in higher education: a case study of Peking University. *Human Behaving Emerging Technology*. 2020;2:113–115. doi:10.1002/hbe2.191
30. Cooper G. Examining science education in ChatGPT: an exploratory study of generative artificial intelligence. *Journal Science Education and Technology*. 2023;32:444–452. doi:10.1007/s10956-023-10039-y
31. Chan C.K.Y., Hu W. Students' voices on generative AI: perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*. 2023;20:43. doi:10.1186/s41239-023-00411-8
32. Goodwin G.P., Piazza J., Rozin P. Moral character predominates in person perception and evaluation. *Journal of Personality and Social Psychology*. 2014;106(1):148–168. doi:10.1037/a0034726
33. Goodwin G.P. Moral character in personal perception. *Current Directions in Psychological Science*. 2015;24(1):38–44. doi:10.1177/0963721414550709
34. Herrmann H., Bucksch H., eds. Character displacement. In: *Dictionary Geotechnical Engineering / Wörterbuch GeoTechnik: English-German/Englisch-Deutsch*. Berlin, Heidelberg: Springer; 2014:217. doi:10.1007/978-3-642-41714-6_31590
35. Ling H.Y., Zinno F., Cheng G., Van De Panne M. Character controllers using motion VAEs. *ACM Transactions on Graphics (TOG)*. 2020;39(4). doi:10.1145/3386569.3392422
36. Mukunda N. The character of physical law. *Current Science*. 2018;114:1554–1555. doi:10.18520/cs/v114/i07/1554-1555
37. Schutte N.S., Malouff J.M. The impact of signature character strengths interventions: a meta-analysis. *Journal of Happiness Studies*. 2019;20:1179–1196. doi:10.1007/s10902-018-9990-2
38. Nainggolan M.M., Naibaho L. The integration of Kohlberg moral development theory with education character. *Technium Social Sciences Journal*. 2022;31:203–212. doi:10.47577/tssj.v31i1.6417
39. Setoh P., Cheng M. *Character Education, Character Values and Moral Behavior*. 2019. doi:10.21979/N9/LCIESP
40. Sarkadi, Casmana A.R., Hisyam C.J., Wardatussa'idah I. Integrating character education into the RECE learning model through Pancasila and citizenship education subjects. *Frontiers in Education*. 2022;7: 841037. doi:10.3389/educ.2022.841037
41. Maisyaroh M., Untari S., Chusniyah T., Adha M.A., Prestiadi D., Ariyanti N.S. Strengthening character education planning based on Pancasila values in the international class program. *International Journal of Evaluation and Research in Education (IJERE)*. 2023;12:149–156. doi:10.11591/ijere.v12i1.24161
42. Baehr J. The varieties of character and some implications for character education. *Journal of Youth and Adolescence*. 2017;46(6). doi:10.1007/s10964-017-0654-z
43. Shorten C., Khoshgoftaar T.M. A survey on image data augmentation for deep learning. *Journal of Big Data*. 2019;6. doi:10.1186/s40537-019-0197-0
44. Abadi M., Chu A., Goodfellow I., McMahan H.B., Mironov I., Talwar K., et al. Deep learning with differential privacy. In: *Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security*. New York, NY, USA: Computing Machinery Association; 2016:308–318. doi:10.1145/2976749.2978318

45. Mnih V., Kavukcuoglu K., Silver D., Rusu A.A., Veness J., Bellemare M.G., et al. Human-level control through deep reinforcement learning. *Nature*. 2015;518(7540):529–533. doi:10.1038/nature14236
46. Dhawan S. Online learning: a panacea in the COVID-19 crisis. *Journal of Educational Technology Systems*. 2020;49:5–22. doi:10.1177/0047239520934018
47. Sohil F., Sohali M.U., Shabbir J. An introduction to statistical learning with applications in R: by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, New York, Springer Science and Business Media, 2013. *Statistical Theory and Related Fields*. 2022;6:87–87. doi:10.1080/24754269.2021.1980261
48. Jordan M.I., Mitchell T.M. Machine learning: trends, perspectives, and prospects. *Science*. 2015;349:255–260. doi:10.1126/science.aaa8415
49. Koul S., Nayar B. Holistic learning education ecosystem: a classroom 4.0 perspective. *Higher Education Quarter*. 2021;75:98–112. doi:10.1111/hequ.12271
50. Liu J., Wu G., Luan J., Jiang Z., Liu R., Fan X. HoLoCo: holistic and local contrastive learning network for multi-exposure image fusion. *Information Fusion*. 2023;95:237–49. doi:10.1016/j.inf-fus.2023.02.027
51. von Davier A.A., Deonovic B., Yudelson M., Polyak S.T., Woo A. Computational psychometric approach for holistic learning and assessment systems. *Future Education*. 2019;4. doi:10.3389/fed-uc.2019.00069
52. Yousef R., Gupta G., Yousef N., Khari M. A holistic review of deep learning approaches in medical imaging. *Multimedia Systems*. 2022;28:881–914. doi:10.1007/s00530-021-00884-5
53. Chronéer D., Backlund F. A holistic view of learning in project-based organizations. *Project Management Journal*. 2015;46:61–74. doi:10.1002/pmj.21503
54. Khenner E.K. Computational thinking in the context of higher education: an analytical review. *Journal of Education and Science*. 2024;26:35–59. doi:10.17853/1994-5639-2024-2-35-59
55. Novopashina L.A., Grigorieva E.G., Ilyina N.F., Bidus I.A. Readiness of future teachers to work at school: review of theoretical and empirical research. *Obrazovanie i nauka = The Education and Science Journal*. 2024;26(2):60–96. (In Russ.) doi:10.17853/1994-5639-2024-2-60-96
56. Mondragón E.M.B., Castro G.A.Q., Castro M.d.P.Q., Arellano M.d.P.C. Bibliometric analysis of climate change research: education in water use. *Obrazovanie i nauka = The Education and Science Journal*. 2024;26(3):176–193. doi:10.17853/1994-5639-2024-3-176-193
57. Velazco D.J.M., Barreiro L.M.A., Chica T.K.M., Medranda E.M.A., Chavez S.A.R. Resilience in vulnerable university groups: an analysis of social work intervention strategies from the perspective of social inclusion. *Obrazovanie i nauka = The Education and Science Journal*. 2024;26(1):82–102. doi:10.17853/1994-5639-2024-1-82-102
58. Sabaoui I., Lotfi S., Talbi M. Association of circadian rhythms with academic, physical, and cognitive performance: a systematic review. *Obrazovanie i nauka = The Education and Science Journal*. 2024;26(1):133–170. doi:10.17853/1994-5639-2024-1-133-170
59. Taufik M. Strategic role of Islamic religious education in strengthening character education in the era of industrial revolution 4.0. *Jurnal Ilmiah Islam Futura*. 2020;20:86–104. doi:10.22373/jiif.v20i1.5797
60. Wan Hassan W.Z., Alias J., Muslim N., Mat N. The inculcation of civilization values as the medium towards the holistic development in malaysia in the era of industrial revolution 4.0. *Universal Journal of Educational Research*. 2020;8:785–793. doi:10.13189/ujer.2020.080308
61. Muhammad A., Malik M.A., Malik H.A.M. Inculcating ethical and moral values amongst the e-learners: proposing a model for e-learning platforms. *European Journal of Educational Research*. 2023;12:455–465. doi:10.12973/eu-jer.12.1.455
62. Fendi H., Agustina., Thahar H.E. Development of digital comics-based learning materials incorporating local wisdom and character values in indonesian language education for junior high school

- students. *Evolutionary Studies in Imaginative Culture*. 2024;8:542–549. doi:10.70082/esiculture.vi.754
63. Azad M.A., Singha H.S., Nahid M.M.H. Zilla-64: a bangla handwritten word dataset of 64 districts' name of bangladesh and recognition using holistic approach. 2021 *International Conference on Contemporary Science and Technology, ICSCST 2021*. doi:10.1109/ICSCST53883.2021.9642594
64. Hananingsih W., Isnaini L.M.Y., Irmansyah J. The role of traditional sports in establishing student character through physical education, sports, and health learning. *International Journal of Human Movement and Sports Science*. 2024;12:538–545. doi:10.13189/saj.2024.120310
65. Sabil H., Ryan J. Science teacher book: science teacher's book: analyzing elementary school students' character values. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*. 2024;8:180–187. doi:10.22437/jiituj.v8i1.32766
66. Chan C.K.Y., Tsi L.H.Y., Yeung N.C.J. An adapted 3P (precursor-process-product) framework for the development of holistic competencies – “Approach to develop” in out of classroom learning. *Study in Educational Evaluation*. 2022;75. doi:10.1016/j.stueduc.2022.101205
67. Dahliyana A., Budimansyah D., Nurdin E.S., Suryadi A., Cahyati S. Project citizen digital: civic education strengthen the national defense character? *Kasetsart Journal of Social Sciences*. 2024;45:159–66. doi:10.34044/j.kjss.2024.45.1.17
68. Kropfreiter E., Bernhard R., McDermott T. Austrian secondary school teachers' views on character education: quantitative insights from a mixed methods study. *Journal of Moral Education*. 2024. doi:10.1080/03057240.2024.2373167
69. Satianingsih R., Rosmiati, Satriawan M., Rakhman F. Perception of pre-service elementary school teachers towards education for sustainable development through character education. In: *E3S Web Conference*. 2024;513:04010. doi:10.1051/e3sconf/202451304010
70. Syamsul A., Miftachul H., Nur Hayati M. Developing Akhlak Karimah values through integrative learning model in Madrasah. *Jurnal Pendidikan Islam*. 2023;9:41–54. doi:10.15575/jpi.v0i0.24443
71. Jordan K.E. The intersection of environmental and sustainability education, and character education: an instrumental case study. *British Journal of Education Research*. 2023;49:288–313. doi:10.1002/berj.3843
72. Syarif M.S., Ghani A.R.A. The model of implementing character-based holistic education in learning. *International Journal of Economic Research*. 2017;14(12):381–390.
73. Trisiana A., Supeni S. Moral value system in Pancasila-based national development: facing the new normal. *Journal of Legal, Ethical and Regulatory Issues*. 2021;24(6):1–12.
74. Liang J. A revisit of 'moral and character education' subject in junior-high school in China. *China Journal of Social Work*. 2016;9:103–111. doi:10.1080/17525098.2016.1231254
75. Taja N., Nurdin E.S., Kosasih A., Suresman E., Supriyadi T. Character education in the pandemic era: a religious ethical learning model through islamic education. *International Journal of Educational Learning, Teaching and Research*. 2021;20(11):132–153. doi:10.26803/ijlter.20.11.8
76. Rosana D., Setyawarno D., Setyaningsih W. Development model of students' innert-depend strategies to face disruption era through best practice film of Android based learning of Pancasila character value. *Journal of Physics: Conference Series*. 2019;1233(1):012098. doi:10.1088/1742-6596/1233/1/012098

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