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The Role of Technological Media in the Character Building Education Process for Generation Z: A Literature Review

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© 2024 The Authors. This open access article is distributed under a (CC-BY License) Abstract: This research aims to determine various technology-based media used in the world of education to shape character for Generation Z Research design and method should be clearly defined. The method in this research is a literature review of various research studies published in Scopus-indexed journals. This is the basis for researchers to choose general keywords, namely "technology media," "Generation Z," and " character education. " These keywords are then used to obtain internal literature data from the Scopus database. The search was carried out in the period 2010 - 2024. The search results obtained 57 metadata, including titles and abstract and analysis was carried out with the help of VOSviewer to find patterns of interrelationship between studies. The result showed learning media, character and character education, and Generation Z began to be discussed in 2020, so research discussing this can still be said to be new research. The visualization image above shows that most of the research that has been carried out discusses students and education. In contrast, more research needs to be carried out regarding learning media. Research on character education and Generation Z is also based on the above visualizations, which previous researchers have yet to carry out much. Based on the research that has been conducted, it can be seen about several benefits from using technology-based learning media, such as AR Alphabet Book, Game Animation Software, Whiteboard Animation Video, Visual Based Learning, Social MediaVideo Games, Visual Game Character Design Digital Anti-Corruption, Interactive Teaching Physics Materials, and E-Assessment

Keywords: Character; Generation Z; Learning media; VOSviewer

Introduction

The rapid development of technology has significantly influenced the world of education, mainly student character education. Smartphones, which are increasingly sophisticated and constantly in the hands of children, allow them to access various pornographic shows and sadistic games, which, little by little, can instill bad character in children, which can manifest in the form of hate speech, bullying, violence, and various actions. Other criminals (Potard et al., 2021; Havighurst et al., 2022; Lesková et al., 2023).

The negative influence of technological developments has the potential to target Generation Z, which is technologically literate and whose daily lives are inseparable from technological products (Hwang et al., 2013; Kristian, 2019). Generation Z is often

nicknamed "Digital Native" because their daily activities cannot be separated from technology, such as enjoying sharing videos on YouTube or using the Snapchat application for photos. Messaging, using smartphones with multi-touch interfaces for telecommunications media, preferring to listen to streaming music, and being fans and game addicts (Eva et al., 2022). Therefore, to minimize the negative influence of technology on Generation Z, which is permanently attached to technology, technology-based learning media, especially games, should be used for character education for Generation Z students.

Technology-based learning media can create a positive learning atmosphere in the classroom, such as high learning motivation, and are easier to observe and understand so that the learning process becomes much more effective for Generation Z students (Dukut, 2019).

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Digital-based learning media can be focused on an effort to make it easier for students to understand subject matter, such as the use of picture books and digital animation to make it easier to learn vocabulary and how to pronounce Z students when learning English, the use of animated videos blackboard to teach about vitamins to generation Z students (Purwaningsih & Anggraeni, 2021), as well as the use of Augmented Reality (AR) technology to teach alphabet letters in kindergarten (Dayang Rohaya Awang Rambli et al., 2013) and Augmented Reality (AR) in the form of The Edupark Game application for biology subjects, especially the theme of biodiversity (Pombo & Marques, 2019).

One of the characteristics of Generation Z is that they like playing games. Learning media can utilize online games to learn across themes like Science. Games can also be made specifically to support learning that contains character education values, such as Hajjgame, which is a game about the rituals of Hajj which instills transcendental and social character so that you become a person who is obedient to Allah SWT, humble and inclusive who does not look down on fellow humans (Ardhian Agung et al., 2010), a video game featuring classical music and drama with a message about the character of honesty of the soul and harmony in life (Herv Supiarza & Sarbeni, 2021), visual games to educate Generation Z students to have an anticorruption character, and various games about environmental awareness amidst global warming and ecological damage (Rahman et al., 2020). This research aims to analyze bibliometrically using VOSViewers to describe the research on the use of technology-based learning media to carry out character education for Generation Z students. This research aims to determine various technology-based media used in the world of education to shape character for Generation Z Research design and method should be clearly defined.

Method

The method in this research is a literature review of various research studies published in Scopus-indexed journals (Figure 1).

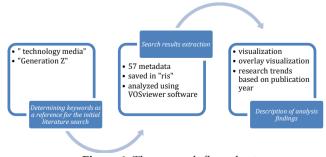


Figure 1. The research flow chart

The literature review stages in this research include three steps. The following are the stages in detail:

Determining keywords as a reference for the initial literature search

This research aims to determine various technology-based media used in the world of education to shape character for Generation Z. Therefore, the literature search focused on studies on technology-based learning media and character-building education for Generation Z. This is the basis for researchers to choose general keywords, namely "technology media," "Generation Z," and "character education. "These keywords are then used to obtain internal literature data from the Scopus database. The search was carried out in the period 2010 – 2024.

Search results extraction

The search results obtained 57 metadata, including titles and abstracts. Next, an initial analysis was carried out with the help of VOSviewer to find patterns of interrelationship between studies. The selected literature is then saved in "ris" form so that it can be read and analyzed using VOSviewer software. VOSviewer is software for visualizing connections between research based on keywords researchers define (Shinta et al., 2024). This software can be downloaded for free (https://www.vosviewer.com/).

Description of analysis findings

The analysis results are then re-selected based on keywords deemed appropriate to the researcher's needs to achieve the research objectives. The analysis in this research focuses on keyword network visualization, overlay visualization, and research trends based on publication year.

Result and Discussion

Learning media is a tool that teachers use as an intermediary to convey learning material to students. Learning media can be digital or non-digital. Examples of digital media are interactive videos, animations, digital games, and audio, while examples of non-digital media are books, modules, and teaching aids (Nainggolan et al., 2019; T Ningsih et al., 2021; Pradibta, 2018). Technological developments that continue to be updated make it easier for every field to carry out its duties. Technology can help make it easier for teachers to process student grades and student data and determine student groups or majors. Generation Z is a generation born between 1995 and 2015 that has the characteristics of being technologically literate, creative, and like to express, but has high levels of anxiety and stress and is easy to complain and self-proclaimed 285 (Hwang et al., 2013; Kristian 2019). The characteristic of Generation *Z*, being technologically literate, certainly makes them accustomed to using technology, such as social media, to connect with friends even without meeting them. Educators must apply technology in learning activities so students become focused and motivated to learn because they use interesting learning media (Fakhrudin et al., 2024; Natsir et al., 2022). This technology-based learning media can be developed in games because Gen Z is highly interested in playing games (Eva et al., 2022b; Fang et al., 2023; Perkins & Echeverry, 2022).

The analysis used in this research was carried out using VOSviewers, which can carry out bibliometric analysis and describe the web of relationships between keywords in previous studies. VOSviewers can produce three visualizations: network visualization to find out the relationship between keywords in previous research, overlay visualization to find out the development of research on character education from year to year, and density visualization to find out how much research has been carried out by previous researchers. The results of the VOSviewers analysis are as follows:

Overlay Visualization

Overlay visualization is one of the results of analysis by VOSviewers, which explains the development of research related to learning media in character education from year to year, namely from 2010 to 2020. Based on the results of VOSviewers' analysis, the following results were obtained (Figure 1).

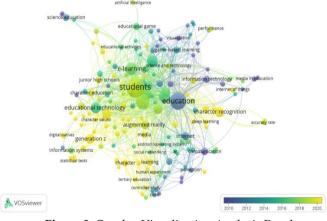


Figure 2. Overlay Visualization Analysis Results

The visualization above explains research development regarding learning media in character education. Based on the image above, it is known that in 2010, research discussed education, science education, communication, parents, children, information technology, knowledge-based systems, and media in education. In 2012, multimedia systems, the internet, knowledge management, educational content, and game-based learning were discussed; then, in 2014, many studies discussed professionalism, major clinical studies, child development, innovation, case studies, computer-aided instruction, and computer science education. In 2016, there was a lot of discussion about curriculum, teaching, educational technology, educational games, science technology engineering, digital storytelling, Chinese characters, and e-learning. In 2018, much research discussed learning systems, acceptance reality, technology virtual models. technology development, animated characters, and animation for students.

In 2020, there will be a lot of discussion about deep learning, learning techniques, character recognition, new media, performance, the internet of things, big data, learning media, junior high school, Generation Z, information management, character. learning, knowledge, augmented reality technology, media, learning media, character education, globalization, elementary school, technology-based, digital culture, and environmental technology (Pantiwati et al., 2024). Based on the explanation above, research regarding learning media, character and character education, and Generation Z began to be discussed in 2020, so research discussing this can still be said to be new research.

Density Visualization

Density visualization results from VOSviewers analysis explain how much research has been carried out on an item by previous researchers. The VOSviewers analysis results obtained are as follows (Figure 3).

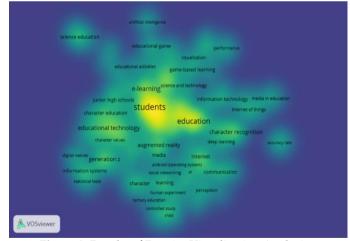


Figure 3. Results of Density Visualization Analysis

The visualization image above shows that most of the research that has been carried out discusses students and education. In contrast, more research needs to be carried out regarding learning media. Research on character education and Generation Z is also based on the above visualizations, which previous researchers

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have yet to carry out much (Rahmi et al., 2024; Tjondro & Ismanto, 2023). This shows that it is important to research technology-based learning media, character education, and Generation Z because only a few have researched this discussion.

Network Visualization

Network visualization is the result of VOSviewers analysis, which explains the relationship between items from keywords from previous research that has been carried out. The results of the VOSviewers analysis are as follows (Figure 4).

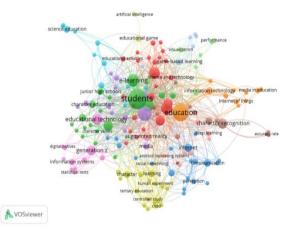


Figure 4. Network Visualization Analysis Results

The results of the analysis above show that there is a web of relationships between items, which are marked by lines connecting one item to another. The analysis results show 13 clusters or groups marked by differences in the colors of each item's lines and dots. Based on the results of this analysis, it was found that learning media, character education, and Generation Z are related to other items, namely media related to learning media, systems, students, education, learning, learning communications, technology, and augmented reality. Then the characters are related to children, human experiments, decision-making, education, learning media, digital media, controlled study, and digital storytelling. Generation z is related to higher education, educational technology, the real world, virtual reality, future generations, social interactions, information management, information systems, and digital natives.

Based on this statement, it is known that Generation Z children are very related to technology, so it is necessary to implement technology-based learning media in learning activities to increase student focus and motivation in class. The technology-based learning media that previous researchers have developed are as follows (Table 1).

 Table 1. Technology-based learning media that have

 been developed

Author	Year	Subject	Media used
Rambli et al.	2013	AR Alphabet	AR Alphabet
		Book for pre-	Book
		school children	
Support	2018	Middle school	Game
		students	Animation
			Software
Purwaningsih	2021	Vocational	Whiteboard
& Anggraeni		school students	Animation
			Video
Min et al.	2016	Elementary	Visual Based
		students	Learning
Susilawati et	2021	Generation Z	Social Media
al.		students	
Shliakhovchu	2021	Generation Z,	Video Games
k et al.		with an average	
		age of 23 years	
Eva et al.	2022	Generation Z	Visual Game
			Character
			Design Digital
			Anti-Corruption
Hasanah &	2019	High school	Interactive
Darvina		student	Teaching
			Physics
			Materials
Tutuk	2021	High school	E-Assessment
Ningsih et al.		student	

Table 1 above is the result of previous research regarding several technology-based learning media that have been developed. Based on the research that has been conducted, it can be seen about several benefits from using technology-based learning media. AR book is a technology-based learning media. According to (Rambli et al., 2013), Augmented Reality, or what is known as AR, can be applied in pre-school education to introduce children to the letters of the alphabet. The application of AR is that by using a camera and computer, children can see a virtual world superimposed on alphabet letters with pattern markers as a means of interaction. The application of the AR Alphabet book to pre-school children shows that it can increase knowledge, focus on learning, ability to memorize, and student activity in learning activities.

Digital animation can be applied to learning activities. Given that Generation Z is a digital generation, it is important to apply technology-based learning media to get students' attention and focus on learning. Research (Dukut, 2018) applies software games in junior high school English language learning to introduce and practice students on listening, reading, writing, and speaking questions related to students' ability to report what they know about the material discussed. This is intended as training material for students to understand TOEFL-based questions, which will help them reach the next level. Digital animation can also be applied through animated videos such as research (Purwaningsih & Anggraeni, 2021), which developed whiteboard animation videos in class X Culinary Vocational School material discussing vitamins in nutrition science subjects. The research results show that the learning media developed is considered very suitable by validators for use as learning media. Visualbased learning also makes it easier for students to understand the material presented. Visual learning media can help students imagine their learning and provide a more direct experience than conventional learning through books (Min et al., 2016).

Generation Z has the characteristics of being technology literate or often interacts with gadgets every day. One of the uses of gadgets for Generation Z is to play social media. Research (Susilawati et al., 2021), which uses social media as a PAI learning medium, reveals that social media is a very relevant medium in teaching Generation Z. This application is considered very appropriate with teacher supervision because Generation Z is very familiar with social media their portion of the virtual world is larger compared to the portion of the real world.

Apart from being familiar with social media, Generation Z is also known to play video games often. This is a reference for developing a video game containing students' learning material. Like research (Shliakhovchuk et al., 2021) that applies a video game to English language learning. The research results show that video games can attract students' attention because they are fun and can also educate students. Using video games in learning can strengthen knowledge of English, informatics basics, strategic thinking, teamwork, cultural knowledge, perspective change, and creativity when using gameplay videos. Character education through video games can also be applied to teach anticorruption attitudes. Research (Eva et al., 2022) which develops anti-corruption digital games. The game being developed has characters with different backgrounds and stories, where the characters are based on the true story of a slightly modified corruption case. This game is played in teamwork to represent the value of traditional games where players have their roles. With this game, players can feel like heroes who can catch corruptors who have damaged the country's human resources. Based on various studies that previous researchers have conducted, it is known that the application of game-based learning can increase students' interest in learning, focus, and motivation to learn, skills, understanding of the material, and teamwork abilities. This is certainly very suitable if applied in learning to improve mastery of material and shape the character of Generation Z students because they are used to rapid technological developments,

making them accustomed to interacting with gadgets (Ardhian Agung et al., 2010; Chang & Chen, 2023; Couceiro et al., 2013; Florou et al., 2009; Ma et al., 2023; MacKinnon et al., 2015; Pombo & Marques, 2019; H Supiarza & Sarbeni, 2021).

Interactive learning media can be created with the help of Ms. Power Point and Macromedia Flash, which are like research (Murtiani et al., 2019) which develops interactive physics learning media that contains character education. This media is known to be very suitable for application in learning because the validity test results reached 86.4 %, and the practicality test reached 93%. The application of interactive learning media can increase students' interest in learning physics and achieve the demands of the 2013 curriculum with character values.

The application of technology in the education sector can also include e-learning and e-assessment. Digitalization has the characteristic of being able to be manipulated and replicated in the network area. The digitalization of learning media is increasingly visible along with increasingly rapid technological developments (Trisiana, 2021). Learning can be digitalized by applying technology, namely media, used as a tool in education or the learning process to make it more effective and easier for students to understand. The aim is to solve learning problems to improve student learning outcomes (Kim & Jeong, 2018; Sudarsana et al., 2019). Examples of the application of technology in learning are e-learning and e-assessment. E-learning is a learning media that utilizes electronic tools online; e-learning provides services for uploading learning videos, learning materials, guizzes, and a place to collect assignments (May et al., 2012). E-assessment is a platform that is almost like e-learning but more focused on collecting and giving student assignments. Learning was carried out online due to the COVID-19 pandemic some time ago; of course, e-assessment helped make it easier for teachers to give or receive student assignments. Research results also revealed that using eassessment can help improve students' reading skills (Tutuk Ningsih et al., 2021).

Conclusion

The search results obtained 57 metadata, including titles and abstract and analysis was carried out with the help of VOSviewer to find patterns of interrelationship between studies. The result showed learning media, character and character education, and Generation Z began to be discussed in 2020, so research discussing this can still be said to be new research. The visualization image above shows that most of the research that has been carried out discusses students and education. In contrast, more research needs to be carried out regarding 288

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Author Contributions

Conceptualization, Shinta and Muh. Azhar; methodology and software, Shinta; validation, Partino and Muh. Azhar; formal analysis, Muh. Azhar; investigation, Shinta.; Resources, Shinta; data curation, Fitriah M. Suud; writing—original draft preparation, Shinta; writing—review and editing, Muh. Azhar; visualization, Shinta.; Supervision, Muh. Azhar. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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