

21st Century Skills Development in Secondary Schools: A Systematic Literature Review

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Abstract: This research aims to investigate the development of 21st-century skills in secondary schools and its implications for students' preparation in facing the increasingly complex demands of the modern era. In this research, 1395 papers were found on related topics and were filtered using PRISMA as a data filtering guide according to the research focus. With a focus on skills such as critical thinking, problem-solving, creativity, effective communication skills, and digital literacy, this research in-depth examines why developing 21st-century skills is so important in education today. This research also examines effective strategies and methods for integrating 21st-century skills into the educational process in secondary schools. The research results highlight the benefits of this approach in creating students who are ready to face a changing world and contribute to an increasingly complex and globally connected society. The results of this research will provide valuable insights for educators, school administrators, and policymakers in efforts to strengthen education in secondary schools to make it more relevant and effective in preparing students for a challenging future. The integration of 21st-century skills in secondary schools is a key step towards forming a future generation capable of adapting, innovating, and succeeding in an ever-changing environment.

Keywords: development of 21st century skills, secondary school, problem solving, problem-based learning

Abstrak: Penelitian ini bertujuan untuk menyelidiki perkembangan keterampilan abad 21 di sekolah menengah dan implikasinya terhadap persiapan siswa dalam menghadapi tuntutan era modern yang semakin kompleks. Dalam penelitian ini, 1395 paper ditemukan pada topik terkait dan disaring menggunakan PRISMA sebagai panduan penyaringan data sesuai dengan fokus penelitian. Dengan fokus pada keterampilan seperti berpikir kritis, pemecahan masalah, kreativitas, keterampilan komunikasi yang efektif, dan literasi digital, penelitian ini secara mendalam meneliti mengapa pengembangan keterampilan abad ke-21 sangat penting dalam pendidikan saat ini. Penelitian ini juga mengkaji strategi dan metode yang efektif dalam mengintegrasikan keterampilan abad ke-21 ke dalam proses pendidikan di sekolah menengah. Hasil penelitian menyoroti manfaat dari pendekatan ini dalam menciptakan siswa yang siap menghadapi dunia yang berubah dan berkontribusi pada masyarakat yang semakin kompleks dan terhubung secara global. Hasil penelitian ini akan memberikan wawasan berharga bagi pendidik, tenaga pendidik, dan pembuat kebijakan dalam upaya memperkuat pendidikan di sekolah menengah agar lebih relevan dan efektif dalam mempersiapkan siswa untuk tantangan masa depan. Integrasi keterampilan abad ke-21 di sekolah menengah merupakan langkah kunci menuju pembentukan generasi masa depan yang mampu beradaptasi, berinovasi dan siap dalam lingkungan yang selalu berubah.

Kata kunci: pengembangan keterampilan abad 21, sekolah menengah, problem solving, problem-based learning

INTRODUCTION

The development of 21st-century skills is increasingly recognized as crucial for preparing students to meet the complex demands of a rapidly evolving global society. These skills, which include critical thinking, creativity, collaboration, and communication, are essential for success in both personal and professional realms (Purwanto et al., 2023). As the world continues to navigate technological advancements and the shift towards a knowledge-based economy,

education systems are under pressure to equip students with these competencies. The ability to adapt, innovate, and problem-solve is now more important than ever, particularly in secondary education, where foundational skills are solidified (Ilma et al., 2023; Shanta & Wells, 2022). Consequently, understanding how best to develop these skills in secondary school settings is a critical area of educational research and practice.

A substantial body of literature has explored various pedagogical approaches to foster 21st-century skills in students. Notably, STEM (Science, Technology, Engineering, and Mathematics) education has been identified as a powerful vehicle for cultivating these competencies, with integrated learning models demonstrating significant positive effects on student outcomes (Asrizal et al., 2023). A meta-analysis of the impact of STEM-integrated learning on science education revealed that such approaches significantly enhance students' critical thinking, creativity, and problem-solving skills (Hebebcı & Usta, 2022). These findings underscore the potential of STEM-based strategies to advance educational practices in ways that align with 21st-century learning objectives.

Other innovative educational methods, such as Educational Robotics (ER), have also been explored for their effectiveness in promoting 21st-century skills. ER has been integrated into both formal and informal educational settings to foster skills like problem-solving, teamwork, and technological fluency (Bano et al., 2024). The systematic review of ER's role in education highlights its capacity to provide interactive, hands-on learning experiences that engage students and enhance their understanding of complex STEM concepts (Budiyanto et al., 2020). Such innovations are indicative of broader trends in education that seek to align learning environments with the skills needed for future success.

Research on the use of non-traditional learning materials, such as loose parts media, has also contributed to our understanding of 21st-century skills development. Studies have shown that these materials can be effective in stimulating children's critical thinking, creativity, collaboration, and communication skills (Sukardjo et al., 2023). By leveraging everyday objects in learning activities, educators can foster a more dynamic and interactive educational experience, promoting deeper engagement and skill acquisition among young learners (Alexis et al., 2023; Heilporn et al., 2021). These approaches represent a shift towards more experiential and student-centered pedagogies in education.

While these studies provide valuable insights, there are also limitations and gaps in the current research on 21st-century skills development. Many studies focus predominantly on primary education or specific skill sets, such as critical thinking or creativity, without sufficiently addressing the comprehensive integration of all four "4C" skills across secondary education (Sukardjo et al., 2023). Additionally, there is a lack of consensus on the most effective pedagogical models, with some studies advocating for STEM-focused approaches while others suggest a broader range of interdisciplinary strategies (Asror et al., 2023). Furthermore, cultural and contextual differences across educational systems are often not adequately considered, limiting the generalizability of findings.

This systematic literature review aims to address these gaps by examining the development of 21st-century skills specifically within secondary school contexts. By synthesizing findings from a range of studies, this review seeks to provide a more comprehensive understanding of the most effective educational practices for fostering these skills. The focus will be on identifying the conditions under which different pedagogical approaches are most successful and exploring the implications for educational policy and practice. This review will contribute to the field by offering evidence-based recommendations for educators and policymakers aiming to enhance the preparedness of students for the demands of the modern world.

METHOD

Design

This study employs a systematic literature review methodology to analyze and synthesize findings from various studies related to the development of 21st-century skills in secondary education. This method is chosen to provide a comprehensive and structured understanding of effective educational practices and current trends in the field. The search process begins with querying major academic databases such as Google Scholar and Scopus, using some relevant keywords. Additionally, the snowballing technique is utilized to identify additional relevant studies from the references cited in the articles already found.

Once potential studies are identified, articles are screened based on titles and abstracts to ensure relevance to the inclusion criteria, such as topic relevance, publication type, and methodology. Articles meeting these criteria are then thoroughly assessed to confirm they align with the established inclusion and exclusion criteria. Data from the selected articles are extracted using a data extraction form, which includes information on methodology, findings, and research implications.

The collected data are then synthesized narratively, focusing on identifying common patterns, differences, and gaps in the existing research. This synthesis aims to provide in-depth insights into effective educational practices for developing 21st-century skills and to offer evidence-based recommendations for educational practice and policy. The findings from this review will be presented in a report following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and quality in reporting results. Through this approach, the study aims to make a significant contribution to understanding and advancing the development of 21st-century skills within the context of secondary education.

Previous Research

This research carefully considers various elements included in 21st-century skills, recognizing the importance of these skills in preparing students to face the increasingly complex challenges of the world. Several previous studies have confirmed that various efforts have been made to enhance these skills; however, there are still significant gaps in the existing literature regarding the effectiveness of the strategies and approaches used, and they are not specifically focused on secondary schools.

For example, the study by Sopin and Sanrattana (2023) demonstrated that interventions through Participatory Action Research could improve students' communication, creativity, critical thinking, and collaboration skills. However, this study was limited to a single school and used a relatively small sample size, making the results difficult to generalize to a broader context, particularly in secondary schools (Sopin & Sanrattana, 2023). On the other hand, the study conducted by Corbano-Reyes (2023) on Project-Based Learning (PBL) showed an improvement in science process skills and 21st-century skills among students. However, the study also highlighted the need for further training for teachers to optimize the implementation of PBL (Reyes, 2023).

Furthermore, a systematic literature review conducted by Ilma et al. (2023) on STEM/STEAM education in Indonesia revealed that while various integrated learning models (Ilma et al., 2023), such as STEM-PjBL and STEM-PBL, have been implemented, there is still no general consensus on which model is most effective in the context of secondary education. This indicates a need for further evaluation of the effectiveness of various approaches in developing 21st-century skills.

In addition, the study by Önür and Kozikoğlu (2020) on the relationship between 21st-century learning skills and educational technology competencies indicates that integrating technology in learning is crucial for the development of these skills (Onur & Kozikoglu, 2020).

However, this study also suggests that a deeper understanding of how technology can be effectively utilized in different contexts is still needed.

Considering these findings, a systematic review of the existing literature will provide a more comprehensive overview of the efforts that have been made, the successes and challenges encountered, and the gaps that need to be addressed in developing 21st-century skills in secondary schools. Therefore, this study is not only relevant but also crucial for advancing research and practice in the field of 21st-century skills education.

Search Strategy and Data Analysis

In this case, the literature search uses Publish or Perish which produces findings on Google Scholar and Scopus in this case, the literature search uses Publish or Perish which produces findings on Google Scholar and Scopus. The series of search keywords used to search for the development of 21st-century skills in secondary schools are:

Table 1. List of Keywords Used in Literature Searches

Literature Search	Keyword
Google Scholar and Scopus in Publish or Pesrish	1. development of 21st-century skills
	2. development of 21st-century skills, secondary school
	3. problem-solving, development of 21st-century skills, secondary school
	4. problem-based learning, development of 21st-century skills, secondary school
	5. problem-solving, problem-based learning, development of 21st-century skills, secondary school
	6. problem-solving, problem-based learning, development of 21st-century skills, secondary school, STEM
	7. problem-solving, development of 21st-century skills, secondary school, STEM
	8. problem-based learning, development of 21st-century skills, secondary school, STEM

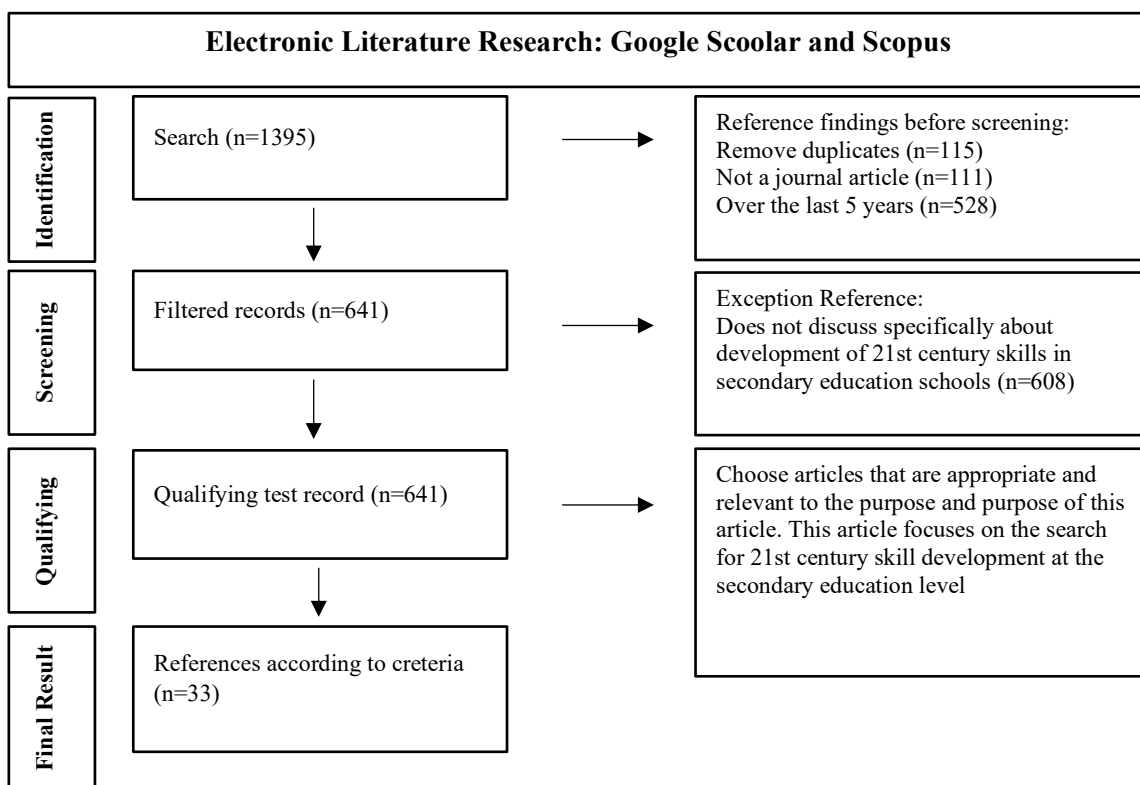


Figure 1. Research Article Selection Process

A literature search was carried out for a decade from 2013 to 2023 regarding the development of 21st-century skills in secondary education schools. Based on PRISMA guidelines, 1395 reference papers were found in the literature search. After filtering duplicate files there are still 1280 reference papers. Non-journal data was then deleted and there were still 1169 articles that met the criteria. After that, references were used for the last 5 years from 2019 to 2023, so there were 641 articles including proceedings and conference types.

After that, a screening process was carried out by removing 21st-century skill development that was not at the secondary school level, 33 articles were found that met the criteria. Based on reference sources that fall into categories and are related to the topic according to the author to be used as primary data comes from several countries where the articles are indexed by Scopus and conference (proceedings).

In this research, the author emphasizes research content analysis which is used to systematically explain and analyze the content of writings such as books, newspapers, and journal articles to make valid conclusions from the text according to the context in which it is applied. Content analysis relates to critical and reflective studies of the management and implementation of learning related to 21st-century skills at the secondary school level.

Table 2. 21st-Century Skills Development in Secondary School

No	Author	Year	Methods	Development Strategy
1	C. Borg Preca	2023	Quantitative	STEM (Science, Technology, Engineering, and Mathematics) education
2	E. Swanzy-Impraim	2023	Qualitative	Initial Teacher Education (ITE)
3	C.M. Norris	2023	Quantitative	Tournament of Minds (TOM) Critical Thinking, Communication, and Collaboration (4Cs)
4	C. Chookhampaeng	2023	Qualitative	Computational Thinking
5	J. Khlaisang	2023	Quantitative	21st Century Learning Skills
6	T Ullah, M Ghafoor	2023	Quantitative	Transformational Leaders
7	L. Ibrayeva	2022	Qualitative	Teachers' Beliefs About Creativity
8	F. Sepulveda	2022	Qualitative	21st Century Learning Skills
9	H. Habiddin	2022	R&D	Information and Communication Technology (ICT)
10	N. Phuseengoen	2022	Quantitative	STEM (Science, Technology, Engineering, and Mathematics) Concepts
11	J. Hernández-Fernández	2022	Qualitative	Upper Secondary School Curriculum
12	D.F.P. Pérez	2022	Qualitative	The Concept of Algorithmic Thinking
13	T. de Wet	2022	Quantitative	Capabilities Approach for Collaboration, Constructive Relationships and Educational Literacy
14	A.D. Marthaliakirana	2022	Quasi experimental	Computational Thinking
15	M. Domingo-Coscollola	2022	Qualitative	Learning Cartographies
16	AA Yaki	2022	Quasi-experimental	Integrated STEM to Enhance Critical Thinking

No	Author	Year	Methods	Development Strategy
17	F. Razali	2021	Quantitative	Integrated STEM in Secondary Curriculum
18	M.D. Ojeda	2021	R&D	Inquiry Activities
19	M.F.T. Saearani	2021	Qualitative	Dance Pedagogy
20	M. Alsharija	2021	Qualitative	Developmental Projects and Policies
21	H.K. Bağ	2021	Mix method	Language Learning
22	I. Basson	2021	Qualitative	Integrated STEM in Curriculum Alignment
23	M.Á. Queiruga-Dios	2021	PBL	Project-Based Learning (PBL)
24	M.A. Tiro	2021	R&D	Literacy Curriculum
25	A. Bako	2020	Qualitative	Inquiry-Based Learning
26	S. Rodriguez	2020	Quasi-experimental	Entrepreneurship Education
27	N. Thambu	2020	Qualitative	Forum Theatre
28	E. Cevik	2020	Qualitative	Cultivating STEM Literacy and Integrated STEM Education
29	AM Zain, H Abdullah, JNI Adnan	2020	R&D	Module Development
30	AAA Alhawri, AAN Alqudsi	2020	Quantitative	Teacher's Role
31	R Hite, A McIntosh	2020	Qualitative	Integrated STEM Using The Engineering Design Process (EDP) and 3D Mixed Reality (A Combination of Virtual and Augmented Realities)
32	Ö Zehra, İ Kozikoğlu	2020	Quantitative	Educational Technology Competencies
33	F.Z. Mohamed Zaki	2019	R&D	Computational Thinking Assessment

RESULT AND DISCUSSION

Result

In this review, it was found that the country that published the most research on 21st-century skills development was Switzerland with 5 articles, followed by the US with 4 articles. If you look at the picture below, the number of scientific literature studies regarding the development of 21st-century skills has become study material that is considered popular because it is spread across various countries that are also developing it. However, if you look at the numbers in each country, there needs to be an increase and development of scientific literature studies that discuss more deeply 21st century skills in secondary schools. (See Figure 1).

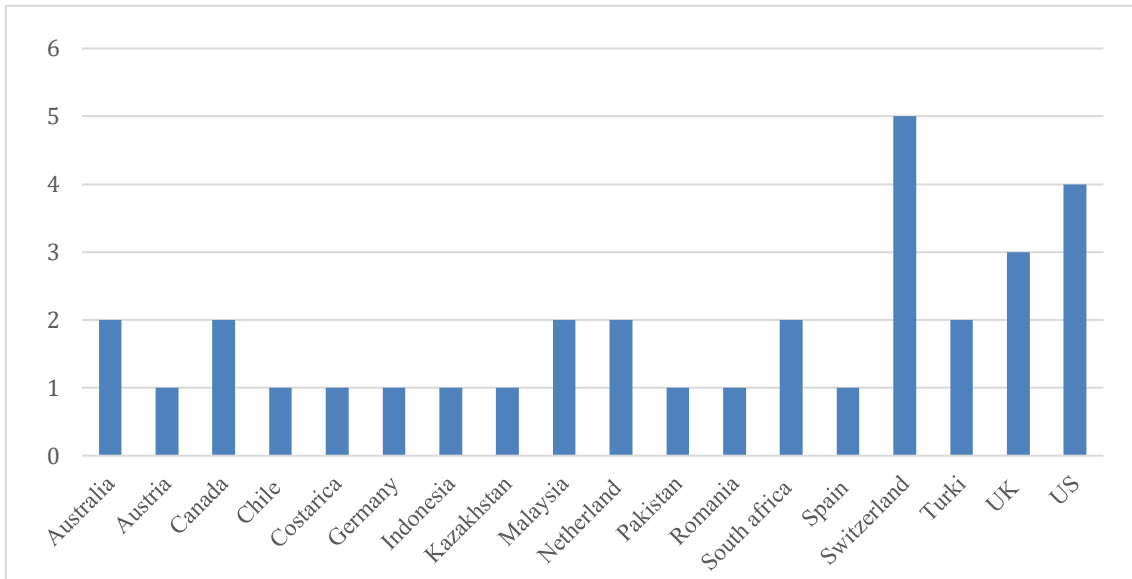


Figure 2. Origin of Publication

And the findings are based on research in references that fit the category of researchers who write the most about 21st century skills development research coming from Malaysia and the US. (See Figure 2)

The development of 21st-century skills, namely 4C (collaboration, communicating, critical thinking, creative) can be implemented at the secondary education level through several strategies that are integrated into educational institutions (See Figure 4). Based on research studies, the research analyzed by the author also uses different research methods in developing 21st-century skills at the secondary education level. The author presents a graph of the distribution of methods used in literature references according to the categories. (See Figure 3)

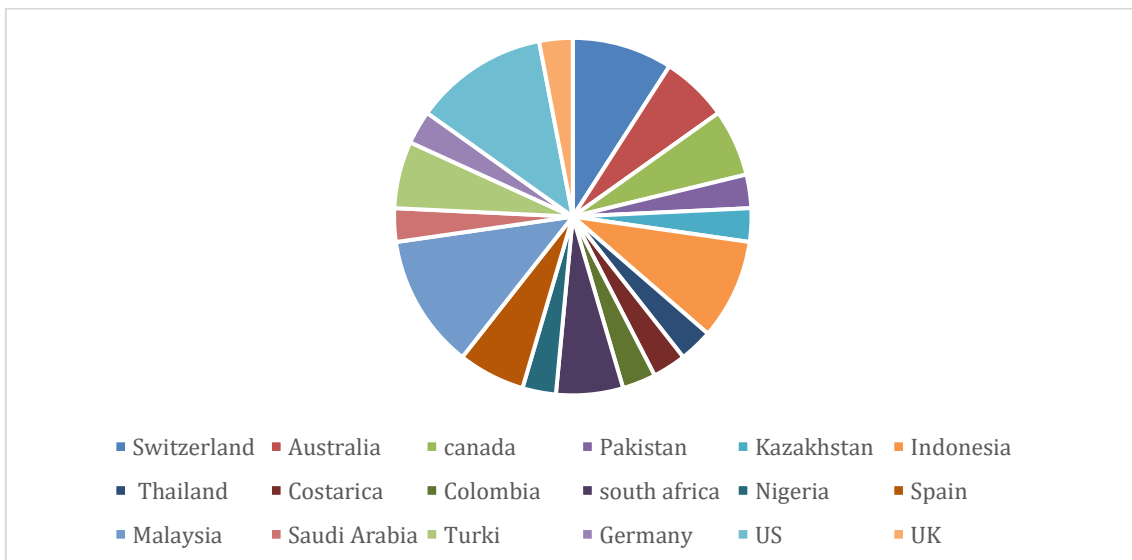


Figure 3. Author's Country of Origin

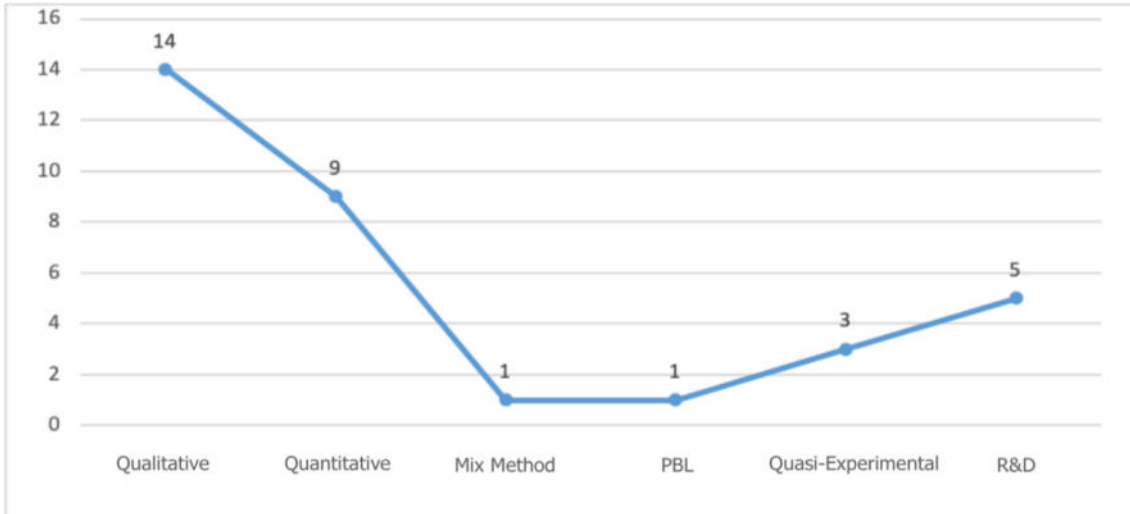


Figure 4. Research Design

The graph explains that the type of method that is most widely used in 21st-century skill development research is qualitative research with 14 articles and the least used research methods are mixed method research and Problem-Based Learning with 1 article each. This shows that research using mixed methods and PBL needs to be developed further. (See Figure 3)

Based on Figure 4, we can also see the graphic distribution of various 21st-century skill development strategies carried out in schools at the secondary education level. From this figure we can find that the most widely used strategy is the integration of STEM in education in developing 21st century skills. (See Figure 4)

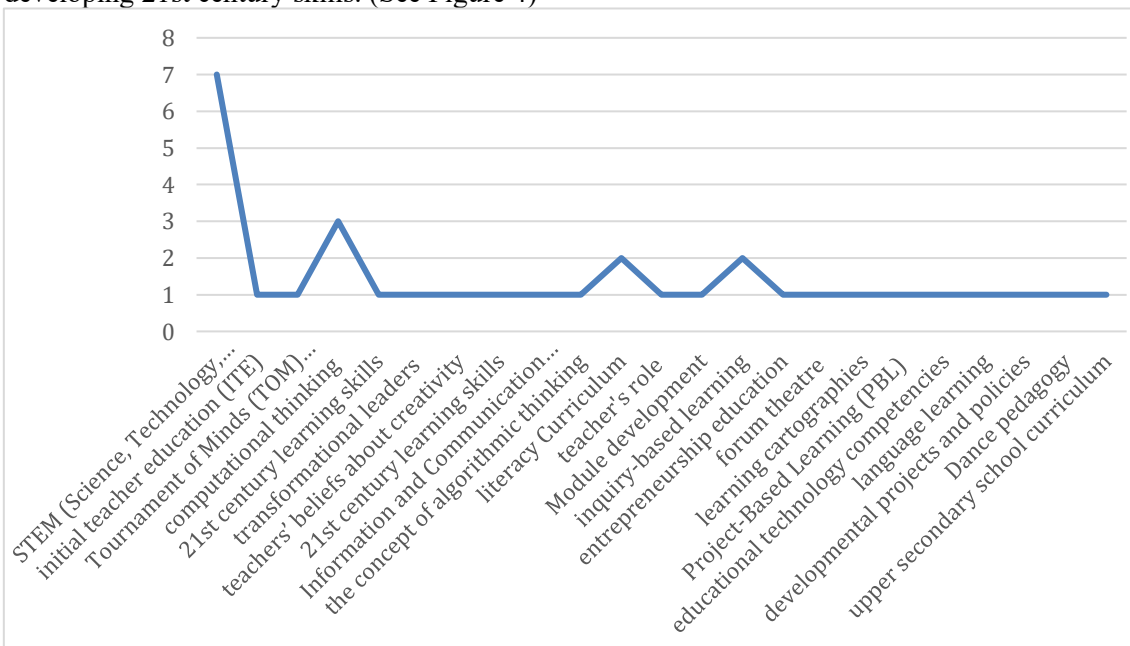


Figure 5. Development Strategy

Discussion

This research focuses on the development of 21st-century skills carried out at the secondary school level. Strategy is an important point in discussing 21st Century Skills Development in Secondary Schools. In this case, the author also explains a little about the supporting factors as well as the challenges and obstacles in developing 21st-century skills.

Integration in the Curriculum

First, adapt subjects to 21st Century Skills. The research results show that the eyes lessons STEM influence and contribute to the development of creativity in students as a young generation. These findings can be integrated into the curriculum in education for the development of 21st-century skills (Borg Preca et al., 2023). According to Pérez & Palacio algorithmic thinking and computational thinking, the use of the concept of algorithmic thinking in school education can help in understanding the relationship between these skills in mathematical problem solving (Pérez & Palacio, 2022). The results of the research findings are in line with research on the implementation of STEM education that has an impact on 21st-century skills known as 4C skills (collaboration, communication, critical thinking, creativity), all of which contribute greatly to the development of interest in students at the secondary education level, facilitating student teams in the field Arts, Language Literature, Social Sciences, as well as Science, Technology, Engineering, and Mathematics (Norris et al., 2023; Phuseengoen & Singhchainara, 2022). In exploring changes in the content and alignment of the three STEM subjects in the secondary school system from the perspective of an interdisciplinary framework. Textbooks, curriculum documents, and planning calendars provide information for content analysis that aligns with technological developments (Basson, 2021). Bağ & Gürsoy's research exploring Critical Thinking training in secondary schools in studying English as a foreign language has implications for language teachers that the integration of CT into learning objectives, learning activities, assignments, assessments, and teacher attitudes is possible and supports the improvement of students' abilities. secondary schools with low levels of proficiency as skilled thinkers in the target language (Bağ & Gürsoy, 2021). Tiro's research found that developing 21st-century skills in secondary education students can be carried out using the literacy assessment method to measure the ability to understand concepts, provide views, and interpret the value of literacy descriptions (Tiro et al., 2021).

Second, Collaborative Projects. Science education in the 21st century emphasizes the development of argumentation and critical thinking skills related to socio-scientific issues (SSI) applied to subjects such as biology (Marthaliakirana et al., 2022). The results show that students involved in PBL learning have higher levels of argumentation and critical thinking. It should therefore be taken into consideration by teachers when restructuring lessons in problem-solving classroom settings. These findings are relevant to integrated STEM learning materials for genetics learning to improve secondary school students' critical thinking skills in biology subjects (Yaki, 2022). This is also in line with Ojeda's research that implementing investigative activities in Chemistry lessons can contribute to the development of 21st-century competencies (Ojeda et al., 2021). the development of students' scientific skills will be enhanced, increasing their scientific literacy, which will produce critical citizens, and the likelihood of interest in scientific-technological careers will increase.

Third, Project Based Learning. Dance pedagogy is a complex and dynamic field of competence involving a wide range of skills and personal performances. The integration of dance in developing competencies for 21st century learning needs which are oriented toward standardizing technological developments relevant to the curriculum, across the domains of knowledge, practice, and feelings (Saearani et al., 2021). Entrepreneurship education programs show improvements in communication and collaboration, opportunity recognition, and critical thinking and problem-solving. Additionally, there is a positive relationship between an increased entrepreneurial mindset and perceptions of future career success (Rodriguez & Lieber, 2020). Development of digital comic media based on mobile applications in social learning that can be integrated into personalized online learning. This digital comic media presents an interactive scientific knowledge platform in the form of digital comic media enriched with Augmented Reality technology (Habiddin et al., 2022). Using visual and narrative methods, secondary school teachers create learning cartographies and then narrate the cartography into discussions of learning concepts and educational practices in the 21st century which encourage the development of 4C skills (Domingo-Coscollola et al., 2022).

Lastly, character-based learning. Developing thinking skills is one of the goals of the moral education curriculum. Theater can be used in moral education pedagogy to improve higher-order thinking skills (HOTS) through theatrical activities that show the development of students' level of thinking skills such as analysis, evaluation, and creation skills (Thambu et al., 2021).

Supporting 21st Century Skills Development

First, teacher development. Teacher beliefs shaping and guiding classroom practices can influence the effective implementation of creativity in the classroom (Ibrayeva, Helmer, and CohenMiller 2022). This is in line with Mohamed Zain's research findings that module development is an important component in planning teaching and learning processes. Module development needs to combine elements that are interesting, creative, interactive, and communicative because they should function as a guide to direct in a particular context (Mohamed Zain et al. 2020). 21st-century learning is a new concept that has become widely accepted globally and aims to produce more flexible learners. This concept is equipped with various skills that can help learners in the world of work of the future. 21st-century learning skills for a group of secondary school students involve the use of ICT skills, creativity, critical thinking, collaboration skills, and leadership. This is in line with Chookhampaeng's research that computational thinking is considered literacy knowledge (reading, writing, and calculation) which is the foundation of learning in the 21st century (Chookhampaeng et al., 2023). The best way to facilitate and develop teaching and learning computational thinking skills for teachers is through training and collaboration with technologies used in teaching and learning computational thinking (e.g., computers, computer programs, smartphones, and multimedia).

Second, Facilitate Collaboration between Teachers. The development of creativity through learning is an important part of the framework of the secondary education system. The successful implementation of creativity from policy into practice in schools depends on teachers in the school system being shaped by teaching experience and training in initial teacher education (ITE) services to increase creativity which is one of the 21st century skills and teaching practices of teachers (Swanzy-Impraim et al., 2023). This is also in line with Norris' research that STEM has implications for collaborative pedagogy initiated by teachers in various learning fields (Norris et al., 2023). This is relevant as teachers need to have 21st-century skills integrated into STEM to increase collaboration, constructive relationships, and educational literacy. This ability can be realized through cognitive and digital literacy, and personal and professional development (de Wet & Rothmann, 2023).

Third, leadership that supports learning 21st-century skills. In Alsharija & Watters' research, it is stated that the modernization of the education system makes knowledge and skills very important for the young generation to master in life in the 21st century (Alsharija & Watters, 2021). Therefore, the education system needs to introduce developments and policies. The role played by the school principal is very important in this process. How a leader facilitates their role as a change agent. The role of leadership style in promoting 21st century skills among secondary school students is transformational leadership (Shamim et al., 2023).

Challenges and Obstacles in 21st Century Skill Development

Different perspectives on efforts to implement STEM in teaching shape students' career interests, this can be seen from approaches such as learning planning, activities, and teacher readiness (Razali, 2021).

Teacher competency in mastering computing media or technology which is still minimal will be an inhibiting factor in integrating 21st century skills in education. Mastery of technology is considered additional knowledge apart from literacy, and they recognize that computational thinking, along with reading, writing, and computing, is the foundation of learning in the 21st century. The best way to guide and develop teachers in teaching and learning computational thinking skills is through training and collaboration with the technology that must be used in teaching and learning computational thinking namely, computers, computer programs,

smartphones, and computational multimedia which involves the following five steps: 1) Providing education to teachers; 2) Teach them by a speaker or mentor in creating activities; 3) Provide activities for teachers to practice together until expertise is achieved; 4) Allow each teacher to present the results of activities; and 5) Teachers collectively summarize the results of activities (Chookhampaeng et al., 2023).

Availability of facilities and infrastructure. The geographical conditions of an area are also a factor that influences the development of 21st-century skills. Areas that are far from access and adequate infrastructure will become obstacles in integrating 21st century skills for teachers students and even the community. So it has implications for the economic welfare of society. Therefore, the government must create solutions through policies that can improve people's standard of living in the development of science, technology, and art.

CONCLUSION AND SUGGESTIONS

The research results show that there are many strategies used in developing 21st century skills at the secondary education level which lead to positive improvements in the development of 21st century skills known as 4C (communicating, collaboration, critical thinking, and creativity) for secondary school students. The most effective strategy to facilitate the development of 21st-century skills in secondary school education is the development of STEM (science, technology, engineering, and mathematics), an approach that integrates 21st-century (4C) skills in learning content or scientific disciplines. This strategy will be more effective if it is included in curriculum development such as project-based curriculum, competency-based curriculum, and technology-based curriculum. Apart from that, it is combined with other strategies, such as literacy, problem-based learning, and others.

In a systematic review of strategies for developing 21st-century skills in secondary school students, we found that the implementation of strategies for developing 21st-century skills in secondary school students cannot only use one strategy but must be a combination of several strategies. A curriculum-based approach is integrated with a cross-subject approach, experiential learning, and parental control involvement from home. The development of 21st-century skills in secondary schools needs to be supported by mixed strategies because each strategy complements the other. Future research needs to consider mixed strategies so that there is a significant increase in the development of 21st-century skills. Currently, research is still dominated by strategies for integrating 21st-century skills into STEM learning content.

In contrast, other studies do not use only STEM. Future research needs to adopt strategies such as the role of transformational leadership in developing 21st-century skills for teachers and students. Entrepreneurship strategies for vocational school students to prepare for the world of work. Strategies with a cultural approach that can build character education. Therefore, future research can use cultural variables in developing 21st century skills. Based on this, the research methods that can be used are qualitative with case study approaches, phenomenology, site studies, and ethnography. Future research would be interesting if it compared public and private schools both within the scope of religious-based schools to identify the effectiveness of implementing 21st-century skills development strategies. Lastly, geographical research in Indonesia related to this topic needs to be followed because it still needs to be improved.

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