Exploring Genius Hour: A literature study on concepts, benefits, and their application at every level of education in various countries

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ABSTRACT

Genius Hour in this article will be studied in the literature, focusing on the concept and benefits of Genius Hour in the context of Education, as well as how Genius Hour is implemented in various countries at different levels of Education. It is hoped that the results of this study can provide further knowledge about Genius Hour and an overview for students who wish to apply to Genius Hour. Genius Hour is an approach to learning by setting aside time in class so students can learn about topics that match their interests or passions, developing essential questions, researching their topics, and creating a final project to be shared at the end of learning. The literature review in this study uses Prisma flow diagrams to assist in the process of determining the literature to be studied.

INTRODUCTION

Almost three years of Indonesian education has been running normally again after the pandemic, but education in Indonesia has not made significant progress. This can be seen from the data taken by the Ministry of Education and Culture and Research and Technology in 2021, which shows that before the pandemic, learning progress for one year (1st grade) was 129 points for literacy and 78 points for mathematics. After the pandemic, learning progress in grade 1 decreased drastically (learning loss) (Rachmawati et al., 2022). For literacy, learning progress is only around 77 points, or it can be said that there is a learning loss equivalent to 6 months of learning, while for numeracy, it is at 34 points, or there is a learning loss equivalent to 5 months (Zainudin et al., 2022). Learning loss is a phenomenon in which children's academic skills and knowledge decline (Cerelia et al., 2021). In another view, learning loss can be interpreted as a loss of interest in learning students due to a lack of interaction with learners during the learning process (Hadi, 2021). Several signs can be observed when a child experiences learning loss, including decreased intellectual ability and skills, decreased achievement and interest in learning, disturbed child

development, psychological and psychosocial pressure experienced by children, and gaps in access to learning (Budi et al., 2021).

In order to reduce the impact of learning loss, the Ministry of Education and Culture provides the freedom to use several curricula that can be selected according to the needs of each school. The curriculum includes entirely using the 2013 curriculum, using the emergency curriculum, and choosing an independent curriculum simplification (Maulida, 2022). Even though the government has provided policies to overcome problems, in some cases in the field, obstacles still occur (Jojor & Sihotang, 2022). As stated by Rofiq Arifin in their research, it was explained that the implementation of the emergency curriculum had not gone as expected; this was due to the lack of available supporting facilities and the lack of understanding of IT from both students and students (Rofiq & Arifin, 2021). Another case example is research conducted by Supriatna, which explains that the emergency curriculum implemented in primary schools is still far from standard, which impacts the effectiveness of online learning (Supriatna, 2021).

Based on the less-than-optimal results from the previous policy, the government, through the Ministry of Education and Culture, tried to study and create a new curriculum called the Independent Curriculum. What can be said to be an independent curriculum results from an evaluation of the implementation of the 2013 and emergency curricula during the pandemic (Sadewa, 2022). The independent curriculum has several main characteristics; among others, learning activities are focused on using a project-based learning model, which aims to develop the profile character of Pancasila students. Then, one of the essential basic competencies is the development of literacy and numeracy. Furthermore, students can design lessons according to their abilities, which are also relevant to the context and local content (Sadieda et al., 2022).

In this study, the researchers wanted to focus on one of the main characteristics of the independent curriculum, namely learning focused using a project-based learning model. Rati explained that project-based learning allows students to manage learning by involving project work (Rati et al., 2019). Project-based learning can potentially create exciting and rewarding learning experiences for students (Culclasure et al., 2019). Furthermore, Sani explained that with project-based learning, students will go through a process of investigating problems that occur in the real world, and based on that, students are expected to be able to create works or products that can be useful for solving these problems (Sani, 2014).

From the explanation above, it can be concluded that project-based learning can provide new learning experiences for students and, at the same time, can help solve problems that occur in society by producing valuable products. Even so, students still need to provide variations or innovations in project-based learning so that students continue to feel enthusiastic about participating in learning (Rahardjanto et al., 2019). One way to create learning that can make students enthusiastic and increase motivation is to apply learning that supports students' interests or passions because supporting this is proven to increase enthusiasm, motivation, and student involvement in learning (Serin, 2017). One project-based learning that can support students' interests and passions is implementing Genius Hour (Horrigan, 2018). Genius Hour can be an effective solution to overcome low student motivation and engagement. Genius Hour allows students to take control of their learning, follow their interests and passions, and explore topics that interest them (Reid, 2019). In Genius Hour, students can choose creative projects they want to realize, which can increase their ownership and responsibility for learning. Genius Hour can increase students' intrinsic motivation by enabling them to explore their interests and talents. When students feel in control of their learning, they feel more engaged and motivated to complete their chosen projects (Zvi & Krebs, 2015).

In addition, Genius Hour is also proven to increase student creativity (Ginsberg & Coke, 2019). Because in Genius Hour, students must use creative, innovative, and problem-solving thinking skills when they choose and implement their projects. This can help them develop the creative skills they need to tackle future challenges. With Genius Hour and a more inspiring learning environment, students will have more opportunities to develop and increase their creativity. This can directly have a positive impact on students' literacy and numeracy. Thinking creatively enables students to approach challenges and concepts innovatively, encouraging them to

become better readers, more effective writers, and more skilled math problem solvers (Brookhouser, 2015).

Unfortunately, the implementation of Genius Hour itself is still sporadic in Indonesia and the world. As revealed by Townsend, less than one percent of students worldwide have had the opportunity to take part in Genius Hour learning; this could be due to a lack of knowledge by students or resources regarding Genius Hour itself (Townsend, 2018). The low number of related sources regarding Genius Hour can be an obstacle for students who want to learn and apply this concept in an educational context. Because Genius Hour is in the context of education, Genius Hour can be said to be relatively new and still in the development stage. However, the scientific literature that specifically addresses this topic is still minimal. In addition to the low levels of support, McNair explains that Genius Hour can often appear messy, as students have difficulty finding clear directions when implementing it. In implementing Genius Hour, students often face difficulties determining the appropriate parameters, objectives, and assessments for the Genius Hour project. Students also experience difficulties in supporting students in developing projects that suit their interests and achieve significant results (McNair, 2022).

Based on the explanation above, the researcher wants to review the literature regarding Genius Hour and how it is applied at different levels of education in various countries. This research will explain the concept and benefits of Genius Hour in the educational context, as well as how Genius Hour is implemented in various countries at different levels of education. It is hoped that the results of this study can provide further knowledge about Genius Hour and an overview for students who wish to apply to Genius Hour.

This research contributes to educators' understanding of Genius Hour. Implementation of Genius Hour as a learning approach by providing free time in class so that students can study topics that suit their interests or hobbies, develop important questions, research topics, and create final assignments to be distributed at the end of the lesson.

METHOD

This type of research is a literature review. This research is a way to solve problems by tracing sources of writing that has been written before. In other words, the term literature study is also very familiar with the term library study. Literature review research is conducted by collecting and synthesizing previous research (Snyder, 2019). The researcher will collect literature from previous studies regarding Genius Hour in this study. The literature in this study was obtained from several sources, such as Google Scholar, Crossref, and Semantic Scholar. The literature search will use only one terminology: "Genius Hour." Apart from that, in this research, the researcher applies specific criteria in selecting the literature that has been obtained, with criteria including research that includes qualitative and quantitative methodologies, then, in the form of journals, articles, and theses/dissertations written by academics and or professional organizations that are known nationally and internationally, then, literature published internationally and nationally, literature published in the last ten years and most recently published in Indonesian/English.

The results of the literature search will be sorted by Prisma flow diagram to help visualize the process to be carried out, with three stages, namely, identification, screening, and inclusion (Page et al., 2021). At the level of identification, results from the exact search (duplicate) will be removed. After that, on-stage screening is the stage of separating the literature that will be examined and not. Paying attention to the title and abstract, the availability of literature with full access, and finally, whether it meets the predetermined criteria. Then, on stage, it includes the results of the literature that will be reviewed.

The amount of literature that has been obtained above will then be reviewed in three phases. The first is data collection information about the problem study, objective study, findings study proposition key and conclusions from any literature obtained. Then, group results from the first phase, define the theme, identify similarities in each, and group him. Phase third: Identify the primary research and determine the leading research (Meity et al., 2017). More detailed steps can be seen in Figure 1.
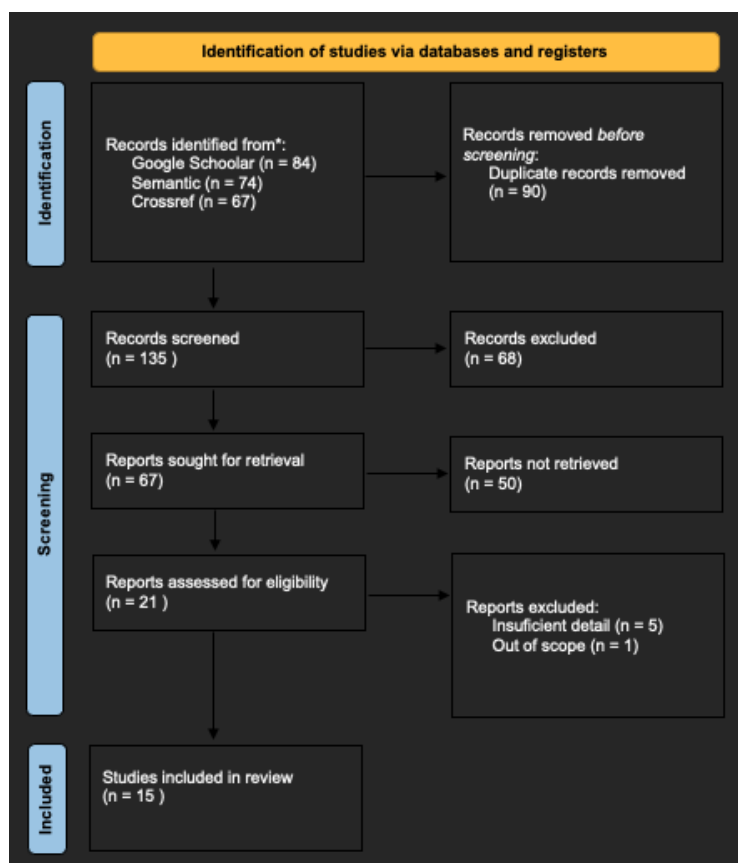
Figure 1. Prisma Flow Diagram

RESULTS DAN DISCUSSION

Results

Based on the search results that have been carried out using the prisma flow diagram method and the search criteria presented in the research methods section, 15 kinds of literature have been obtained, which can be seen in Table 1. The publication years of the 15 articles found were 2016, 2017, 2018, 2019, 2020 and 2021 from various educational levels among them Kindergarten, Elementary School, Junior High School, Senior High School and College. Spread across several countries including America, Brazil, Australia, Canada, Saudi Arabia, South Africa and Indonesia. Summary of selected paper shown in Appendix A.

Table 1. List of Literature

No.	Literature of Kinds	Amount
1	Journal	6
2	Article	1
3	Thesis	6
4	Dissertation	2
Total		**15**

Discussion

Genius Hour, or 20% Time, is a learning concept that gives students time to explore their interests and passion in a project they choose. Technology company Google first introduced this concept in the early 2000s. Although there is no single inventor of Genius Hour, this practice became well known through Google's corporate policy of allowing employees to spend 20% of their work time exploring personal projects or their creative interests (B. Machado et al., 2021). In the context of Education, Genius Hour is a learning approach that gives students structured time to

explore their interests and projects. Genius Hour enables students to become active agents in learning, developing critical thinking skills, creativity, and independence. In addition, Genius Hour is proven to increase students' intrinsic motivation, strengthen collaboration skills, develop digital literacy, and help students discover their interests and talents. Genius Hour can provide opportunities for students to experience freedom and responsibility in learning, expand their understanding of the world, and prepare them to face future challenges (LeGeros et al., 2022). In implementing Genius Hour, it is necessary to pay attention to the following principles (Townsend, 2018), shown in Figure 2.
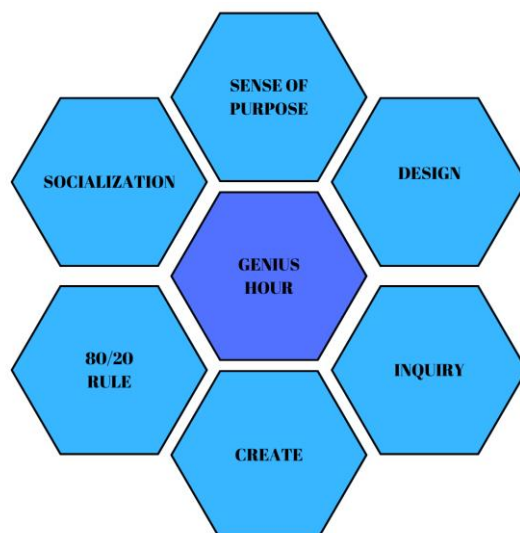

Figure 2. Genius Hour Principles

Sense of Purpose

In learning, a "sense of purpose" will differ based on the goals to be achieved (Lin & Wei, 2021). Inside Genius Hour encourages students to discover creativity, innovation, and critical thinking by allowing them to do what they love and take responsibility for their learning.

Design

Learners are free to design their learning, such as choosing tactics, methods, sources, and freedom about what they want to learn. Learning design will significantly influence the success of their projects (Fan et al., 2021).

Inquiry

Inquiry is a series of learning activities that focus on developing critical and analytical thinking skills to teach students to seek and find their answers to a problem posed. Besides that, it is also deep (Abdi, 2014). Explaining that inquiry learning will attract students' interest in science, provide opportunities for students to use appropriate research techniques to collect evidence, require students to solve problems using logic and evidence, then encourage students to carry out further studies to develop more complex explanations, and emphasize the importance of writing scientific explanations based on evidence.

Create

In Genius Hour, students do not just create a project or product, but there is a problem that bothers them, and they want to solve.

80/20 Rule

The 80/20 rule is to give students at least 20% time to work on what they are most curious about in an educational context. The remaining 80% will be in the form of traditional educational methods. Students can also choose the time for Genius Hour, whether to give 10 minutes per

lesson, 1 hour per day, or maybe one day per week. Each student is allowed to choose a plan that suits their class.

Socialization

Social interaction occurs not only between students and students but also with friends even with experts regarding the topic they will be working on.

Application of Genius Hour in Kindergarten

At the kindergarten level, there is one article that discusses Genius Hour. In this article, Genius Hour refers to a learning approach that allows students to explore their interests in their chosen projects. The implementation of Genius Hour in this article is carried out for one hour per session for five weeks. Breaking down about 10-15 minutes for mini-lessons, then continues, with the remaining 45-50 minutes spent supporting individual children and small groups as they work on Genius Hour activities. The application of Genius Hour in this study began with helping students develop ideas for the Genius Hour project. The way to do this was by using a graphic *organizer* with four statements: "I wonder…," "I wish…," "I know a lot about…," and "I think you should know…." Then, from the results, the learner chooses what idea to use. After the idea has been determined, students begin to develop projects from these ideas, assisted by students and related sources, and there are also some students whom experts directly assist. In the last step, students provide several options for choosing presentation models. Students can choose one of these models or methods and then present the results of the Genius Hour project in front of the whole class (West & Roberts, 2016). Implementing Genius Hour in kindergarten allows children to develop curiosity, creativity, and critical thinking skills. Through Genius Hour, students can choose topics they are interested in and work on projects relevant to them. They are given a set time to complete the project while the learner is a facilitator and mentor. In the context of kindergarten, Genius Hour encourages children to explore their interests in areas such as art, science, math, or physical activity. They can engage in activities such as painting, building, role-playing, simple experiments, or creating works of art. Thus, Genius Hour at the kindergarten level provides a fun, interactive, and relevant learning experience for children at an early age (West & Roberts, 2016).

Implementation of Genius Hour in Elementary Schools

At the elementary school level, several articles specifically discuss how to implement Genius Hour in elementary schools. First, Genius Hour is implemented for children aged ten years or 5th grade in Brazil. The implementation of Genius Hour in this article is carried out from the first-week students enter school, with each meeting taking approximately 1 hour. The implementation of Genius Hour in this article is divided into seven steps:
1. Sensitization: showing a motivational video about creativity, innovation, the importance of sharing ideas, persistence ("never give up"), and using passion to create a solution.
2. Reflection: The reflection process begins with the question, "How can I use passion to answer my problems or questions"? In this step, students try to find topics of interest.
3. "Shark Tank Pitches". Students prepare a 3 to 5-minute presentation that demonstrates their conception of the idea in terms of four points: what, why, how, and indication of success. Classmates and students actively participate in this moment, providing suggestions, criticizing, and evaluating the project's feasibility.
4. Planning: Students prepare steps and schedules at this stage. Students develop procedures to achieve their goals by making time schedules for each activity, such as literature research, material procurement, prototype development and refinement, presentation exercises, and final presentations.
5. Project Design: Students start working on their projects at this stage. At this stage, students or parents also need to supervise and provide guidance so that students stay on the right track.
6. Presentation Preparation: Students prepare a presentation of the results of the project that has been done. Students prepare their final presentation. They explained what, why, and how within five minutes.

7. Sharing Results: In this step, students present the results of the projects they have worked on in the Genius Hour project.

The Genius Hour project in this study is divided into three categories based on the difficulty level. The first level is easy (learners can develop their products and may not need to receive help from adults), the second level is Medium (students may need help from adults on several occasions), and the last is the problematic level (students need adult help). This study shows that the majority of students choose the project level that is easy to complete with the theme of the project being worked on by students is a project about "Toys/Games" (N = 59), then "Robotics" (N = 14), "Scale Model" (N = 10), "Video Production" (N = 10) and many more. The benefit of Genius Hour in this research is the development of essential characteristics to become a successful entrepreneur, such as self-motivation, discipline, self-confidence, determination, and creativity. Besides that, creating a learner-centered learning environment, developing critical thinking, creating social learning and opportunities to increase individual strengths, connecting students to the real world, and getting them involved in solving problems using their "passion" (B. Machado et al., 2021).

Furthermore, research was conducted in South *Sydney Church of England Grammar School* on a 6-year-old boy. This project was designed to take advantage of highly motivational learning situations as a means for children to learn more about how to work collaboratively and to demonstrate understanding of their interactions with peers during learning sessions. During the exercise, children research, experiment, and practice making multiple decisions and working collaboratively in small groups. The results of this study indicate that applying Genius Hour to students aged six years can provide motivation, flexibility, and freedom. In addition, this research also shows that Genius Hour can foster the ability to collaborate in students aged six years. This is indicated by the emergence of the nature of being responsible for the group, respecting all views and listening to others, and the emergence of students' self-confidence in contributing to groups (Harrington, 2016).

The following research is about designing a Genius Hour "Handbook." There are several things in the handbook: First, the design schedule for Genius Hour is implemented every week for 30-60 minutes and is reviewed from the students' daily academic schedule. Then, it presents aspects of teaching Genius Hour and examples of projects students have successfully carried out. *The handbook's* function is to facilitate the implementation of Genius Hour, but the role of the learner is vital; do not get too caught up in what is in the handbook. Because students still need to instill trust, honesty, and openness between students. Also, providing a comfortable learning environment will increase learner engagement and prevent disruptive behavior later (Reid, 2019).

Furthermore, there is research conducted in Indonesia by Aida. The background in this research is because of looking at the learning process, which often only focuses on fulfilling the exam requirements without providing space to get to know and explore students' interests. With Genius Hour, it is hoped that learning that occurs can provide meaningful experiences for all students, as well as inspire students to learn passion. The combination of Genius Hour and Tokkatsu differentiates this research from others. This merger aims to increase student collaboration skills while helping students develop their interests and potential for the topics they are interested in (Fandilah, 2020). Tokkatsu is an activity carried out in the learning process but not tied to a particular subject. Tokkatsu activities are a strategic step in maintaining the balance of the overall development of students, who have good cognitive skills and are supported by balanced emotional maturity, social skills, and communication skills (Miharja et al., 2020). The result is that the combination of Genius Hour and tokkatsu is suitable for implementing teaching and learning activities. Tokkatsu acts as a tool to create learning situations, while Genius Hour is a learning activity. By combining the two, it can reduce possible obstacles that may arise (Fandilah, 2020).

Implementation of Genius Hour in Junior High Schools

Two articles specifically discuss implementing Genius Hour at the junior high school level. The first is research conducted by Opsahl, which aims to explore the impact of Genius Hour, which focuses on environmental issues and students' attitudes toward the environment. This study will analyze whether participation in Genius Hour, which leads to environmental projects, can

change students' attitudes towards environmental issues, such as awareness, concern, and environmental responsibility. Genius Hour is implemented for one hour every week, lasting five weeks. Students can develop projects related to the natural environment or other environmental issues in this research. In this project, students will use their time to explore and carry out projects that contribute to their understanding of environmental issues and provide creative solutions. Through this Genius Hour, which focuses on the environment, it is hoped that students will experience positive attitudes toward the environment, including increasing awareness, concern, and responsibility for environmental issues. The results of this study indicate that the Genius Hour centered on the environment mainly influences students' attitudes towards the environment. At the start of the study, most students were interested in choosing their environmental topic, but the proportion decreased at the end. Through Genius Hour, students learn to undertake step-by-step projects driven by student interests (Opsahl, 2018).

Subsequent research was conducted by (LeGeros et al., 2022). This study provided an understanding of the implementation of personalized learning for junior high school students through Genius Hour, which is applied to all schools. This study aims to provide insight into how Genius Hour can support and strengthen a personalized learning approach to students. Here are some potential steps to implement personalized learning in middle classes through school-wide Genius Hour:

1. Develop a clear understanding of personalized learning: Learning and school stakeholders need a shared understanding of how it can benefit students. This can be achieved through professional development, reading research articles, and attending conferences (Olofson et al., 2018).
2. Introducing the Genius Hour concept: Learners can introduce it to students and explain how it aligns with personalized learning. They may also provide examples of successful projects from the previous year.
3. Set aside a specific time for Genius Hour: Schools must designate a specific time each week or month. This time must be protected and not used for other activities.
4. Provide resources: Students should provide students with the resources they need to complete their projects, such as access to technology, materials, and support experts.
5. Monitoring progress: Students should monitor student progress during Genius Hour and provide feedback and support as needed. They can also use this time to evaluate students' understanding of essential concepts and skills.
6. Evaluate effectiveness: Schools should evaluate the effectiveness of their personalized learning initiatives, including school-wide Genius Hours. This can be done through surveys, focus groups, and other data collection forms (DeMink-Carthew et al., 2017).

This study resulted in 3 main findings. First, how do students perceive Genius Hour to affect student engagement in learning? From these questions, it was found that the implementation of Genius Hour had a positive impact on student engagement and students' *development of self-direction skills*. The second research question is: How do students describe their experiences implementing Genius Hour? From these questions, it was found that Genius Hour can improve communication between learners and also encourage collaboration. Finally, how does the application of Genius Hour affect the pedagogy of each learner? Moreover, the result is that there are various changes in the pedagogy of each learner (LeGeros et al., 2022).

Application of Genius Hour in Senior High School

Several articles specifically discuss the Senior High School level. The first is Alqahtani's research, which explains the context in this study is how to apply Genius Hour to mathematics so students can have skills such as creativity, self-confidence, and a sense of self-reliance to obtain information and train them to become influential researchers. In this study, students worked with two classes as the treatment group involved in Genius Hour and two classes as the control group. The results of this study will compare the achievements between the treatment group and the control group. As a result, Alqahtani revealed that Genius Hour is an effective differentiation strategy that students can use to meet the needs of individual students. Alqahtani also stated that

Genius Hour allows students to learn new things, experiment with ideas, and develop many needed skills (Alqahtani, 2021).

Subsequent research by Reuer explained that Genius Hour is a project-based instructional technique that encourages learning autonomy and has received much student support. However, despite the widespread enthusiasm for Genius Hour in K-12 grades, there has not been sufficient empirical evidence regarding the effectiveness of this approach. To fill a gap in this research, a long-term exploratory case study was conducted better to understand Genius Hour practices in high school STEM environments. One of the exciting things in this research is the effect of Genius Hour on the identity and self-efficacy of students, especially in science, and confidence in science. The quantitative results show that the Genius Hour instructional technique increases students' confidence in their scientific abilities based on pre-and post-survey data, although the effect is relatively small. In addition, students experience significant improvement in Science and Engineering Practices (Next et al. Practices) in asking questions, defining problems, and analyzing and interpreting data. Although the quantitative analysis did not produce significant results showing the effect of Genius Hour on student identity, substantial qualitative results show that participation in Genius Hour develops student identity, especially identity in science (Reuer, 2017).

Furthermore, Aldehbashi explains that his research aims to investigate and explore the use of Genius Hour and Makerspace in the context of education for students. Makerspace is a space or area dedicated to creative activities, exploration, and product creation. Typically, Makerspace come with various tools and materials that allow students or other users to design, build, and design with different projects and ideas. Makerspace can include tools such as 3D printers, computer programming, electronics, handyperson tools, and many types of creative software. The research aims to assess the effectiveness of Genius Hour and Makerspace in increasing student engagement, creativity, and skills. In addition, the research also aims to understand the impact of using Genius Hour and Makerspace on student learning, including increasing conceptual understanding, applying practical skills, and developing interest and motivation to learn (Macaraeg et al., 2021). The result of implementing Genius Hour at Makerspace provides an open learning environment that encourages critical thinking, collaboration, creativity, and problem-solving. In addition, it makes it easier for students or users to develop practical skills, understanding concepts, and interests in fields such as science, technology, engineering, art, and mathematics. Makerspace also encourages independence and self-exploration, where individuals can follow their interests and ideas to produce unique and innovative projects (Aldehbashi, 2021).

Next, research contains plans for Genius Hour units for senior high school students, including instructional guides, handouts, and a rubric that can be used immediately in a Genius Hour project. The Genius Hour activities designed in this study use a research-based pedagogy and will be used as a guide for learners who are trying to apply Genius Hour for the first time. Genius Hour has the potential as a strategy to increase student interest in the STEM field. When students interview experts in their area of interest, they will better understand the possible career paths they can choose. In addition, this also gives them learning experiences that are relevant to the real world (Horrigan, 2018).

Implementation of Genius Hour in Higher Education

There is an article discussing the implementation of Genius Hour at the higher education level conducted by Downes & Figg, where the research aims to describe the results of an investigation on how learning that focuses on the use of inquiry and problem-based learning, especially learning with Genius Hour can provide 21st-century competencies to students of educational programs at the University of Ontario. In this study, Genius Hour was applied to the "technology methods" course, designed to create a learning environment that makes it easier for students to understand the learning material provided. Then the Genius Hour design will also encourage students to think critically, ask challenging questions, and find answers to current and future world problems. In addition, this design also aims to provide a learning experience that is more related to personalization, especially in topics that interest students. Also, in this design, researchers will apply three simple principles from Genius Hour (Juliani, 2014). First, projects must be driven by high-level questions that stimulate critical and innovative thinking. Second,

these questions must be explored through traditional or direct experience research. Third, the projects' results must be shared with others so that students can contribute and share their knowledge with the community (Downes & Figg, 2019).

This research was conducted using a qualitative method with 35 research subjects, students of the Education program at the University of Ontario. The result of this study is that students show a positive perception of learning with Genius Hour. Then, the results of the data analysis reveal that there are three main themes. First, factors contributing to positive perceptions of learning with Genius Hour are found. These factors include increased involvement, autonomy, and opportunities to explore personal interests. Second, participation in Genius Hour has encouraged creativity and mental well-being among students. Engaging in independent learning and pursuing personal interests can increase creativity and provide a sense of fulfillment, positively impacting mental well-being. Finally, this research shows that participation in Genius Hour helps students gain a better understanding of teaching with technology. Students can utilize various existing technological tools and resources through involvement in this project, enhancing their knowledge and skills in integrating technology into future teaching practice. Overall, this research implies that the Genius Hour project had several positive outcomes for students, including fostering positive perceptions of learning, encouraging students' creativity and mental health, and increasing students' understanding of the use of technology in Education (Downes & Figg, 2019).

From the results of the analysis above, it can be seen a comparison of the implementation of Genius Hour at each level of education Table 2. below this:

Table 2. Genius Hour at Every Level of Education

Educational Level	Implementation of Genius Hour	Benefit	Project Example
Kindergarten	Provide creative time for students to explore their interests, such as painting, building, or role-playing.	Encourage children's creativity and imagination. Helps develop social and sharing skills. Strengthen understanding of basic concepts.	Draw landscapes, build mini-cities, and play roles in fairy tales.
Elementary School	Provide time for students to develop interest-based projects, such as science experiments or art projects.	Increase student interest and motivation to learn. Bring up research and inquiry skills. Promote creativity and innovation.	Research animals, create artwork based on favorite themes, and create simple games.
Secondary School	Allows students to explore their interests with more in-depth student learning projects, such as creating apps or social research.	Encourage problemsolving and critical thinking skills. Broaden knowledge and understanding in the area of interest of students. Train skills and communication	They make mobile apps, research social media's impact, and make documentaries.
College	Provide time for students to carry out research projects, academic explorations, or innovations in their field of study.	Reveals high research and problem-solving abilities. Encouraging innovation and creativity in the field of study. Deepen understanding and mastery of academic concepts.	Conduct scientific research, create new technological projects, and develop contemporary works of art.

Next, several studies are not specific to a certain level. First, Quinn's research discusses from a learner's perspective, where this study is based on how learners can design exciting and meaningful learning experiences for adolescents and prepare them to use technology to help them become lifelong learners. From these questions, the researcher felt that Genius Hour was an appropriate approach. This is also supported by many students and students who have shared their experiences through various digital media regarding the positive impact when they run Genius

Hour. However, no formal research has been conducted to describe this phenomenon's implementation or the experience of running Genius Hour. So, from the explanation above, the researcher will qualitatively examine the implementation of the Genius Hour process, which students in public schools have carried out at the junior high school level. This study also describes how students perceive the challenges, planning benefits, and benefits for students when implementing Genius Hour. As a result, students adopted the same structure for Genius Hour, but the format and emphasis varied by class. Later, students observed they were actively engaged during Genius Hour but sometimes noticed them procrastinating on project work and losing interest in their chosen topics. Finally, each school has a systemic dimension that may hinder the Genius Hour process. These systemic factors include stakeholder reactions to the idea and implementation of Genius Hour. In addition, students' perceptions of what is considered important work and expectations of school work (Quinn, 2021).

The following research is about creating a Genius Hour framework. The main objective of this research is to create an instructional framework to implement Genius Hour in the classroom. In addition, this research also examines and analyzes how the concept of Genius Hour is applied in education worldwide to synthesize information into a collective Genius Hour framework. The results of this study show that Genius Hour benefits higher-order thinking skills. The applied Genius Hour framework contains interest, passion, autonomy, and inquiry. In addition, this research also reveals that a framework is needed to help implement Genius Hour in the classroom. However, the role of the learner himself is equally vital in Genius Hour (Townsend, 2018).

Subsequent research regarding implementing Genius Hour in the BC or "British Columbia" curriculum. This curriculum emphasizes intellectual, social, emotional, and physical development and promotes deep understanding, practical application, and critical thinking (Sinnema et al., 2020). The British Columbia curriculum allows schools and students to customize learning according to local needs and student interests. Jane conducted this research to create a guidebook for elementary to high school. Hopefully, this book will support and guide the implementation of Genius Hour in the classroom using the BC curriculum principles. This handbook will provide a framework for effectively implementing Genius Hour to empower learners' choices and increase engagement. In addition, this book will also provide resources for students to implement Genius Hour projects. The primary purpose of this guidebook is to create a guide that can be used to guide the use of Genius Hour in class and also to help other students who will implement it in their class for the first time (Jane, 2021).

The results of this study stated that the handbook developed could maximize the learner's role as a facilitator. With the handbook created, students will be more prepared to study independently when researching and creating their projects. This allows the learner to gradually assume the role of facilitator in the classroom by only assisting individual students when needed. Jane strongly encourages students to try Genius Hour, especially if motivation and engagement concern the students in your class. Also, keep in mind that the lessons and ideas in the handbook that have been created are only a medium to help how Genius Hour can be implemented. Learners can make adjustments as needed to meet the needs of their respective students (Jane, 2021).

CONCLUSION

This literature study explores the concept, benefits, and application of Genius Hour in education. Genius Hour is an approach in education that provides time and space for students to explore their interests in learning. This concept encourages freedom, creativity, and student initiative in determining the project or topic they want to research. Genius Hour has various benefits for students. Literature studies show that Genius Hour can increase student motivation and involvement in learning. It can also develop critical skills, creativity, problem-solving, collaboration, and independent initiative. Genius Hour can also help connect learning to students' interests, increase learning ownership, and develop self-confidence. Genius Hour can be applied at various levels of education, from kindergarten to tertiary level. However, there may be variations in the implementation. The basic concept of Genius Hour is to provide time for students to explore their interests, where the concept will be relevant at all levels. Learners can adapt this approach

according to the needs and context of learning at each level. Differences in Implementation of Genius Hour in Various Countries: Although Genius Hour is implemented globally, there are differences in its implementation in various countries. Curriculum, education policies, school culture, and resources can influence how Genius Hour is adopted and integrated into each country's education system. These conclusions show that Genius Hour is an approach that has the potential to provide significant benefits to students at all levels of education. However, more research and further exploration are needed to understand the concept, benefits, and application of Genius Hour in various countries' education contexts.

Appendix A. Summary of selected papers

No.	Authors	Country	Kinds of Literature	Type of Research	Level of Education
1	(West & Roberts, 2016)	America	Journal	Qualitative	Kindergarten
2	(B. Machado et al., 2021)	Brazil	Journal	Qualitative	Elementary School
3	(Harrington, 2016)	Australia	Article	Qualitative	Elementary School
4	(Reid, 2019)	America	Thesis	Mixed Method	Elementary School
5	(LeGeros et al., 2022)	America	Journal	Qualitative	Junior High School
6	(Horrigan, 2018)	America	Thesis	Qualitative	Senior High School
7	(Downes & Figg, 2019)	Canada	Journal	Qualitative	College
8	(Opsahl, 2018)	America	Thesis	Mixed Method	Junior High School
9	(Reuer, 2017)	Canada	Dissertation	Mixed Method	Senior High School
10	(Aldehbashi, 2021)	Saudi Arabia	Journal	Qualitative	Senior High School
11	(Quinn, 2021)	America	Dissertation	Qualitative	Junior High School-Senior High School
12	(Townsend, 2018)	South Africa	Thesis	Mixed Method	Elementary School-Senior High School
13	(Fandilah, 2020)	Indonesia	Thesis	Mixed Method	Elementary School
14	(Alqahtani, 2021)	Saudi Arabia	Journal	Qualitative	Senior High School
15	(Jane, 2021)	Canada	Thesis	Mixed Method	Elementary School-Senior High School

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