Proceedings of the 50th Annual Conference of the International Association of School Librarianship and the 25th International Forum on Research on School Librarianship
Columbia, South Carolina
July 11-15, 2022

Students' Information Gathering Behaviors and Teachers' Approaches to Improve Inquiry-Based Learning Outcomes in Middle School

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Abstract: *The purpose of this study is to identify students' information gathering behaviors and teacher's approaches to improve their learning outcomes in middle school inquiry-based learning. We compared the differences in behaviors in the information gathering process between learners with high and low understanding of the themes as their learning outcomes and teachers' instructions. The analysis targeted seven students who selected two themes of SDGs, and two teachers. Students with a high level of understanding of the themes could collect the materials based on the pillars of investigation (sub-subjects). Students with low understanding of the themes were unable to collect such materials. The findings suggest the importance of the teachers' approaches regarding how to extract keywords related to the pillars of investigation for searches in regular classes.*

Keywords: *Information gathering behavior, Inquiry-based learning, learning outcomes, pillars of investigation*

Introduction

Inquiry-based learning refers to a series of learning activities in which "problem-solving activities are repeated in a developmental manner (Ministry of Education, Culture, Sports, Science and Technology, 2017, p.9)." According to the Courses of Study, a series of learning activities means that students:

> find problems on their own based on questions and concerns that arise

> when they look at daily life and society, collect information on specific problems, organize and analyze that information, connect it to knowledge and skills, and work to solve problems by sharing their ideas. They then summarize and express their clarified ideas and opinions, identify new issues, and begin to solve further problems (p.9).

In Japan, the revision of the Courses of Study in 2017 / 2018 places a greater emphasis on the process of inquiry-based learning in the Period for Integrated Studies. The goal of the Period for Integrated Studies is for students to acquire the qualities and abilities to solve problems independently and to think about their own way of life through inquiry-based learning, and 50 or 70 hours per year are allocated for it in middle schools.

Statement of the Research Problem

In inquiry-based learning, learners' understanding of the research themes is output as the learning outcomes. To gain a broader understanding of the themes, it has been suggested that it is effective to establish several pillars of investigation, which are sub-subjects related to the theme's content (Suzuki & Suzuki, 2021). The "pillars for investigation" are set up by the students in the "Making a plan" process of the Tokuda's model (Table 1). "The pillars of investigation" means sub-subjects related to the theme. Tokuda states "the pillars of investigation" as "A guide to solving issues." In the "Making a plan" process of the Tokuda's model, the previous experiment improved the learning outcomes of elementary school students by setting up the pillars of investigation and demonstrating them to students (Suzuki and Suzuki, 2021). In Japan, however, the process of "Making a plan" is rarely implemented and the processes from the "Gathering information" are often practiced in regular classes. Therefore, it is necessary to identify the information gathering behaviors that improve learning outcomes in regular classes.

Table 1

The process of "Investigate" within "Three Steps and Eight Processes of Inquiry-Based Learning" (Tokuda, 2009)

Investigate	Processes	Student activities
	1) Making a plan	·Make a prediction ·Set up pillars of investigation ·Make a plan to investigate ·Keep records of learning
	2) Gathering information	·Utilize pathfinders ·Gather data ·Make a list of materials ·Find information ·Evaluate information
	3) Searching based on the gathered information	·Retrieve information ·Fill in cards for recording
	4) Solving a problem	·Organize and consolidate the card for recording side by side ·Generate a conclusion ·Keep record cards and organize resource lists

In the process of inquiry-based learning, it is necessary to teach students to take the actions that a person with information literacy (IL) would take to better understand the research themes and solve problems (Suzuki, 2017). The American Library Association Presidential Committee on Information Literacy stated "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information (American Library Association, 1989)." To promote IL, it is necessary to clarify the relationship between students' behaviors and teachers' instructions in the process of inquiry-based learning and their learning outcomes, and then to consider teachers' approaches to students.

Therefore, the purpose of this study is to identify students' information gathering behaviors during the process of the "Gathering information" and teachers' approaches to improve their learning outcomes in middle school inquiry-based learning. We compared the differences in behaviors in the information gathering process between learners with high and low understanding of the themes as their learning outcomes and teachers' instructions for both types of learners.

Literature Review

Learning process model in inquiry-based learning

To instruct students to take the same actions as people equipped with IL, overseas process models for IL development (models of learners' behavioral processes) and Japanese learning process models created with reference to overseas models are useful.
The overseas process models include “Big 6 Skills” (Eisenberg et. al., 2000), “Information Search Process” (Kuhlthau, 1989), and “Guided Inquiry” (Kuhlthau, et. al., 2012). “Guided Inquiry” is a model for IL development that shows eight processes of learners who search for information and guidance by teachers and librarians.

“Three Steps and Eight Processes of Inquiry-Based Learning” (Tokuda, 2009) is an example of a Japanese learning process model. The three steps are “Grasp,” “Investigate,” and “Communicate.” Compared with overseas process models, the characteristic of this model is that it divides the process of “investigate” into smaller steps. However, it does not show specific guidance for students.

Information gathering process within inquiry-based learning

The learning process in inquiry-based learning as described in the Courses of Study is based on “Set the theme,” “Gather information,” “Organize and analyze information,” and “Summarize and express information.” “Gather information” corresponds to the “Investigate” in Tokuda’s model. As mentioned above, in Japan, the “Making a plan” process of the Tokuda’s “Investigate” is rarely implemented in regular classes, while the processes from the “Gathering information” are often practiced in regular classes.

The “Gathering information” process of the Tokuda’s model shows five student activities. Three student activities conducted in regular classes (“Gather data,” “Find information,” and “Evaluate information”) were the subject of this practice.

Niwai (2016) shows student learning activities that further subdivide the three student activities (“Gather data,” “Find information,” and “Evaluate information”) in the “Gathering information” of Tokuda’s model (Table 2).

Table 2
The items of learning activities of students in Niwai (2016)

Tokuda's model	The students' learning activities
Gather data	Actively use libraries
	Use school libraries
	Use school public libraries
	Search for materials while looking through bookshelves
	Search for materials that are not in your own library
	Find magazine articles
	Find newspaper articles
	Plan for information retrieval
	Select appropriate media for an appropriate purpose

Tokuda's model	The students' learning activities
Evaluate information	Compare multiple pieces of information
	Determine the authenticity of information

Tokuda's model	The students' learning activities
Find information	Actively use books
	Research using a book
	Research using reference books
	Research using encyclopedias
	Research using cyclopedias
	Research using illustrated books
	Research using dictionaries
	Research using statistics
	Research using yearbooks
	Research using maps
	Research using white papers
	Research using handbooks
	Research using newspapers
	Research using magazines
	Use audio-visual media
	Use electronic media
	Use computers
	Research using the internet
	Research using search engines
	Research using CD-ROMs
	Research using online databases
	Research using information files
	Research using other materials
	Create search expressions
	Create appropriate keywords for searches

There are some difficulties related to instruction concerning the information gathering process. Niwai (2016) shows that the content of instructions for the use of the school library, which is not addressed in inquiry-based learning despite the need for instruction in inquiry-based learning, is concentrated in the information gathering process within inquiry-based learning. Other sources of information that students often use the internet as a source for gathering information to solve problems (Cabinet Office, 2020). They do not make full use of the materials in the school library (Sugawara & Hagihara, 2006).

Methodology

Period

The practice was conducted in a total of seven sessions from October to December 2020. During this period, students gathered information based on the actions of "Gather data," "Find information," and "Evaluate information" in the process of "Gathering information" in "Investigate" within "Three Steps and Eight Processes of Inquiry-Based Learning," (Tokuda, 2009) where information gathering process is subdivided.

Each class session lasted 45 minutes. In the first session, the teacher explained which materials to collect, and the students downloaded the screen recording software. In the second session, the teacher explained the newspaper database, and the students gathered information on their own. The information gathered included the causes, background, current situation, and countermeasures of the themes of social issues. In the third session, guidance was provided on the research themes and on how to find materials in the school library. In the fourth and fifth sessions, students continued to gather information. Students summarized the information they gathered on slides, including summarizing their own solutions. In the sixth and seventh sessions, students gave interim reports in the seminar using the slides, teachers gave advice and guidance, and students continued to collect more information. Before the first session, students had finished setting the themes, and after the last session, they made presentations in the seminar.

Participants

Participants were 17 ninth grade students (third-year middle school students in Japan) and two teachers, including the researcher. Themes for inquiry-based learning on the SDGs were chosen by the students themselves. Based on the social issues related to the SDGs chosen by the students, the students were divided into nine groups according to their SDG preference.

The participants were divided into two seminars that set themes related to SDG 1 "Eliminate poverty," SDG 4 "Quality education for all," SDG 8 "Job satisfaction and economic growth," and SDG 11 "Create communities where people can continue to live." The targets for analysis were the groups focused on SDG 4 (four students) and SDG 8 (three students). These SDGs had themes unfamiliar to the students and for which it is difficult to set up the pillars of investigation.

The participants included the teachers, whose consent was obtained (Teacher A) out of the nine supervisors, and the researcher (Teacher B).

Outline of the Practice

During the Period for Integrated Studies, the students investigated the social issues' a) cause / background, b) current status, and c) what is already being worked on for the solution and proposed d) own solution, summarizing a) to d) on slides. The main sources of information were school library materials and websites. Students were free to gather information without any other restrictions, although they were required to find one book.

Classes were held in regular classrooms equipped with Wi-Fi. Each student was given one Chromebook. The school had a high use of Chromebooks in other classes. The school library held and displayed materials for the class and provided resources. Students used the school library outside of class time.

Procedure
Before practice

First, approval for this practice was obtained from the Ethics Review Committee of Faculty of Library, Information and Media Science, University of Tsukuba. An explanation of this practice was given to the school principal, teacher A, and the students, and consent was obtained. Consent was also obtained from the students' parents.

Next, the students were assigned an alphabetical letter. A folder shared in Google Drive for submitting the recorded data was created for each alphabetical letter and set to be used only by the researcher and the relevant student. Several sheets were then created to be collected from students and teachers.

First Session

The first session included instructions on how to submit and answer the collection sheets. The students also worked on downloading "Nimbus Screenshot & Screen Video Recorder" (screen recording software) to their Chromebooks. The sheets collected on this day were the students' "Reflection sheet [for the beginning of the practice period]" and the teachers' "Instruction and observation record sheet."

"Reflection sheet [for the beginning of the practice period]" was for students to respond to the questions about information gathering at the beginning of the practice period. In "Instruction and observation record sheet," the teachers entered their teaching records at the end of each class. The teachers recorded the content of the day's instruction, the timing and reason for the instruction, and the students' conditions after the instruction.

Second Session

At the beginning of the second session, Teacher B explained how to use the newspaper database, and the students gathered information. Information gathering in the practice aimed to investigate a) cause / background, b) current status, and c) what is already being worked on for the solution. The sheets collected on this day were the students' "Reflection sheet [for the end of each class]," "Information-seeking behavior record sheets," and the teachers' "Instruction and observation record sheet." In addition, "Screen recordings" movie files were also collected.

"Reflection sheet" was used by the students to reflect on their searching activities and was answered at the end of the second to seventh sessions. In "Information-seeking behavior record sheets," students were asked to record information from reference materials; one was for recording information on paper media, and the other was for recording information on electronic media. Students recorded on one sheet per reference only when information was recorded. The questions were divided into three stages: "before recording," "while recording," and "while evaluating."

"Screen recordings" were movie files that the Chromebook software had recorded of the students' Internet searches. Students turned on the recording function of the software when they searched the internet and saved the data in the shared Google folder at the end of the class.

Third Session

In the third session, guidance was provided on the research themes and information gathering; for the latter, the students were mainly explained how to search for materials in the school library. The sheets collected on this day were the students' "Reflection sheet [for the end of each class]," "Information-seeking behavior record sheets," and the teachers' "Instruction and observation record sheet." In addition, "Screen recordings" movie files were also collected.

Fourth and Fifth Sessions

During the fourth and fifth sessions, each student continued to gather information. Teacher B explained to the students that they should use not a sentence, but rather a word, in search expressions, and they should separate keywords with a space, when using multiple keywords. The sheets and files collected on this day were similar to those of the third session for both students and teachers.

Sixth to Seventh Sessions

In the sixth to seventh sessions, students were divided into seminars and made interim reports based on the slide materials. After the reports, the students received advice and guidance from the teachers and continued to gather information based on the advice. The sheets and files collected on this day were similar to those of the third session for both students and teachers.

In the seventh session, “Reflection sheet [for the end of the practice period]” also collected from students. The completed slides were submitted by the students to the teachers as a product of the class in January 2021 or later.

After the practice, the researcher explained the collection of slides for analysis to the principal and the students and obtained their consent. After collecting the consent forms, the students’ slides were collected.

Findings

Grouping students by learning outcome scores

The students in the analysis are L, M, N, and O for SDG 4 and G, P, and Q for SDG 8.

We scored their broader understanding of the themes using the slides, which were the product of learning. We then compared behaviors in information gathering process between the high group X and the low group Y, which had high and low learning outcome scores, respectively, within groups with the same SDG goals.

Scoring the learning outcomes

The scoring was based on the percentage of agreement between the pillars of investigation and the keywords required to examine each goal of the SDGs and the keywords extracted from the slides created by the students. Five criteria for scoring were used.

Criteria 1 and 2 were based on whether or not the contents that corresponded to the pillars of investigation were summarized in the slides. Criterion 1 was stricter than criterion 2 and assessed whether or not both the “content” that corresponded to the pillars of investigation and the “keywords” were included in the slides. Criterion 2 was based on whether or not the “content” that corresponded to the pillars of investigation was summarized in the slides.

Criterion 3 was related to how many of the central keywords needed to explain the pillars of investigation were listed in the slides. Criterion 4 addressed how many nouns that were necessary to explain the pillars of investigation were listed in the slides. Criterion 5 indicated whether the slides summarized the subheadings of each slide presented by the teachers.

To extract "keywords necessary to investigate each goal of the SDGs," we searched for materials related to the SDGs (mainly encyclopedias for middle school students) and identified the materials. The procedure for extracting keywords from the materials was as follows. First, the titles of the main pages were extracted from the table of contents.

Second, the pillars of investigation was set up for each title; for example, the pillars of investigation for SDG 8 included seven issues such as "child labor" or "labor problems in the world."

Third, for each of the pillars of investigation, keywords necessary to explain the pillar were extracted from the headings in the page; for instance, for SDG 8, "forced labor" and "ILO" were extracted. These keywords were positioned as subordinate terms for the pillars of investigation. In addition, nouns that appeared more than once in the text were also extracted, but they were considered to be subordinate to the keywords extracted from the headlines. For example, in SDG 8, "rights" and "workers" were listed.

Keywords were extracted from the slides created by the students, except for those on the reason for setting the themes and the reference list. Keywords were also excluded from the keywords extraction if they were listed as subheadings in slides presented by the teachers. Finally, the pillars of investigation and keywords extracted from the materials were matched with the keywords extracted from the students' slides and scored for each criterion.

Grouping Results

Based on the results of scoring the slides (Table 3 and Table 4), the SDGs 4 and SDGs 8 groups of students were divided into high and low groups using the median for each criterion. No difference between students in both groups was found for criterion 5, and criterion 1 was too rigorous; therefore, criterion 2, which combines both the perspective of the pillars of investigation and the knowledge acquisition perspective, was deemed appropriate. Students were divided into the high group X and the low group Y, based mainly on their scores related to criterion 2 in each SDG group.

As a result of the grouping, Group X for SDG 4 was students M and O, and Group Y for SDG 4 was student N and L. Group X for SDG 8 included students G and Q, while Group Y was made up of only student P.

Table 3
Results of scores for the SDG 4 group

Student	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
M	1 (14.3%)	4 (57.1%)	7	1	6
O	1 (14.3%)	3 (43%)	5	7	6
N	0 (0%)	2 (28.6%)	2	1	6
L	1 (14.3%)	1 (14.3%)	3	2	6

Note: The scores ranged from 1 to 7 in Criterion 1 and 2, from 1 to 23 in Criterion 3, from 1 to 63 in Criterion 4, and from 1 to 6 in Criterion 5.

Table 4
Results of scores for the SDG 8 group

Student	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
G	2 (28.6%)	3 (43%)	1	6	6
Q	2 (28.6%)	3 (43%)	1	14	6
P	0 (0%)	1 (14.3%)	0	9	5

Note: The scores ranged from 1 to 7 in Criterion 1 and 2, from 1 to 13 in Criterion 3, from 1 to 56 in Criterion 4, and from 1 to 6 in Criterion 5.

Extraction of behaviors in information gathering process of Group X and Y
Extraction method of behaviors in information gathering process

"Gather information" corresponds to the "Investigate" in Tokuda's model. Students' behaviors were evaluated according to the items of the students' learning activities in Niwai (2016) corresponding to each action (Table 2). Under "Gather data," the number and types of materials that the students browsed and referred to were compared between Groups X and Y. In "Find information," the contents of the evaluation were also compared.

Behaviors that showed differences between Group X and Y in "Gather data"
The SDG 4 group

As a result of extracting behaviors in "Gather data," "Select appropriate media for an appropriate purpose" was found only in Group X. The number and type of materials browsed and referred to by each student were compared. The result showed no clear difference between Groups X and Y (Table 5). Student O of Group X browsed and referred to technical books. Student L of Group Y browsed and referred to reference books. Student N of Group Y did not browse and refer to paper media.

We checked how many of the materials browsed and referred to contained the content of the pillars of investigation, using the content of all the materials browsed and referred to by each student and the pillars of investigation for SDG 4. The results showed that there were more electronic media and paper media Group X browsed and referred to that corresponded to the pillars of investigation rather than Group Y (Table 5). The materials and keywords for searches that Group Y browsed and referred to were a little different from the content of SDG4, and there were few materials related to the pillars of investigation.

The SDG 8 Group

The results concerning the students' behaviors indicated none of those listed in Table 6 were unique to Group X.

The number of materials browsed and referred to also clear difference between Groups X and Y (Table 6).

To determine how many of the materials browsed and referred to contained the contents of the pillars of investigation, the content of all the materials browsed and referred to by each student was matched using the pillars of investigation of SDG 8. The results showed that there were more electronic media that Group X browsed and referred to that corresponded to the pillars of investigation rather than Group Y. In addition, the paper media that Group X browsed and referred to contained items that corresponded to the pillars of investigation, while the paper media that Group Y browsed and referred to did not contain items that corresponded to the pillars of investigation (Table 6). The materials and keywords for searches that Group Y browsed and referred to were a little different from the contents of SDG8, and there were few materials related to the pillars of investigation.

Table 5
Number of materials browsed and referred to by the SDG 4 group

Group	X		Y	
Student	M	O	N	L
Paper media	2 (2)	1 (1)	0 (0)	1 (0)
Electronic media	15 (11)	26 (17)	17 (1)	7 (2)

Note: The numbers in parentheses indicate the number of materials corresponding to the pillars of investigation.

Table 6
Number of materials browsed and referred to by the SDG 8 group

Group	X		Y
Student	G	Q	P
Paper media	2 (2)	2 (1)	1 (0)
Electronic media	7 (7)	18 (7)	6 (1)

Note: The numbers in parentheses indicate the number of materials corresponding to the pillars of investigation.

Behaviors that showed differences between Group X and Y in "Find information"
The SDG 4 group

As a result of extracting the behaviors of "Find information," the behaviors found only in Group X were "Research using white papers" and "Create appropriate keywords for searches."

For "Create the appropriate keywords for searches," Group X was able to create appropriate keywords for searches, but Group Y was not. After the teachers explained search expressions and keywords for searches to all students, Group X was able to create appropriate search expressions.

The SDG 8 group

The behaviors that were seen only in Group X in SDG8 were "Actively use the book." Group X used more books than Group Y.

Behaviors that showed differences between Group X and Y in "Evaluate information"

The SDG 4 group

The extraction of behaviors for "Evaluate information" showed no differences between Group X and Group Y. Both determined the authenticity of authors in the electronic media sources; thus, both groups were partially able to "Determine the authenticity of information."

The SDG 8 group

The behaviors that were seen only in Group Y in SDG8 were "Determine the authenticity of information." Group Y determined the authenticity of authors in the electronic media. Thus, Group Y was partially able to "Determine the authenticity of information."

Teachers' instructions

In this study, we analyzed the teachers' instructions during the "Gathering information" process in the Tokuda's model. Only learners with a high level of understanding of the themes in both learning groups (SDG 4 and SDG 8) showed behaviors of collecting the materials based on the pillars of investigation.

In "Gather data," the teachers recommended referring to the paper media to all students. In "Find information," teacher B instructed to all students how to create search expressions in the fifth session. When student O of the Group X asked a question about keywords for searches, teacher B provided only the student with the supplementary instructions on keywords for searches and introduced websites related to the pillars of investigation. In "Evaluate information," teacher A introduced all students to reliable websites. Even though several students browsed the websites, none used them-in their studies.

Discussion

The purpose of this study was to identify students' information gathering behaviors and teachers' approaches to improve their learning outcomes in the process of "Gathering information" as practiced in regular classes in inquiry-based learning at middle school.

As a result of the analysis, only learners (Group X) in both learning groups (SDG 4 and SDG 8) who had a high level of understanding of the themes showed behaviors of collecting the materials based on the pillars of investigation. This suggested the important role of collecting the materials that correspond to the themes of the pillars of investigation to improve the outcomes of inquiry-based learning.

In the “Gathering information” process, the search expression instructions were given to all students. However, teacher B did not directly explain the search expressions or keywords for searches related to the pillars of investigation. Only one student of Group X who asked a question about keywords for searches could get information on the keywords for searches and websites related to the pillars of investigation. This case suggested the information related to the pillars of investigation might be effective. The other students of Group X may have set up the pillars of investigation on their own before the “Gathering information” process. It will be necessary to increase the number of participants in the practice, and further focus on the “Making a plan” process in middle school inquiry-based learning.

Only Group X was able to collect materials that corresponded to the pillars of investigation. Tokuda described how to extract keywords for searches from table of contents in books (Tokuda, 2009). Therefore, the result suggested books would be more useful than the Internet for setting up to the pillars of investigation. It will be effective for teachers to encourage students to “Actively use books” during the process of the “Gathering information.”

Implications and Conclusions

Students with a high level of understanding of the themes could collect the materials based on the pillars of investigation. The supplementary instructions on keywords for searches and introduction of websites related to the pillars of investigation would be effective.
As mentioned above, in Japan, the process of “Making a plan” is rarely implemented. In the current situation, similar instructions should be provided with more students in the “Gathering information” process. Future research will include the “Making a plan” process in middle school inquiry-based learning.

The teachers' approaches regarding how to set up the pillars of investigation could have great potential for improving outcomes in middle school inquiry-based learning. It will be necessary to examine students’ behaviors that enhance learning outcomes in other themes and teachers' approaches to these behaviors.

References

American Library Association. (1989, January 10). *Presidential Committee on Information Literacy: Final Report.* Association of College and Research Libraries. https://www.ala.org/acrl/publications/whitepapers/presidential

Cabinet Office. (2020, July). *Survey on Attitudes of Children and Youth, 2019*. https://www8.cao.go.jp/youth/kenkyu/ishiki/r01/pdf/s2-4.pdf

Eisenberg, M., Berkowitz, R. E., Darrow, R., & Spitzer, K. L. (2000). *Teaching Information & Technology Skills: The Big6 in Secondary Schools*. Linworth

Kuhlthau, C. C. (1989). Information Search Process: A Summary of Research and Implications for School Library Media Programs. *School Library Media Quarterly, 18(1),* 19-25.

Kuhlthau, C. C., K. M. Leslie, & Caspari, A. K. (2012). *Guided Inquiry Design: A Framework for Inquiry in Your School*. Libraries Unlimited.

Ministry of Education, Culture, Sports, Science and Technology. (2017, July). *Commentary on Instructional Guidelines for Junior High School: Integrated Study Time (Heisei 29nenKokuji).* https://www.mext.go.jp/component/a_menu/education/micro_detail/__icsFiles/afieldfile/2019/03/18/1387018_012.pdf

Niwai, F. (2016). A Comparison between Information Literacy Education in Course and Library Instruction: An Analysis of Description in Teachers' Manual. *Educational Information Research, 32(2),* 13-24. https://doi.org/10.20694/jjsei.32.2_13

Sugawara, J., & Hagihara, T. (2006). User studies of junior high school student's information seeking: the effect of library and internet use on student's information seeking behavior. *Educational Informatics Research, 4,* 47-65.

Suzuki, K. (2017). Chapter 12: Youth and Libraries in an Internet Society. In H. Itsumura, N. Takubo, T. Harada (Eds.), *For Students of Library and Information Science* (pp. 123-134). Sekai Shisousha.

Suzuki, K., & Suzuki, H. (2021, September 24). *Development and Evaluation of An Investigative Learning Support Program for Elementary School Students to Search and Understand Subjects in Social Studies from Multiple Dimensions.* International Association of School Librarianship. https://journals.library.ualberta.ca/slw/index.php/iasl/article/view/8293

Tokuda, E. (2009). *Learning Style Instruction in Elementary School: Promoting Inquiry-Based Learning (Teaching how to learn in elementary school: To promote inquiry learning).* Zenkokugakkoutoshokankyougikai (Japan School Library Association)

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