Connecting Inquiry and Information (1)

~Series: Practices Toward "Data-Driven Inquiry" as an SSH-Designated School~
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1. Integrated Inquiry and Comprehensive Learning

The term "inquiry" has become widely recognized in the education community over the past few years. This term gained popularity following the revisions to the Course of Study guidelines. Specifically, the former "Period for Integrated Study" implemented in elementary through high schools was transformed into the "Period for Inquiry-Based Cross-Disciplinary Study" with the 2018 revisions. The major difference between "learning" and "inquiry" lies in the students' "autonomy" in their activities. According to the "2015 Course of Study Implementation Status Survey (High School - Period for Integrated Study)", the percentage of students responding affirmatively to questionnaire statements such as, "I set my own challenges and work toward solving them", decreases as school levels advance. In other words, while elementary and junior high school initiatives showed promising outcomes, it was noted that these outcomes were not sufficiently connected to appropriate practices in high schools. Reflecting on my own experience, I cannot recall what activities I participated in during the "Period for Integrated Study" in high school. This lack of memory suggests the activities were not particularly impactful or meaningful to me.

The reasons behind the insufficient implementation of the "Period for Integrated Study" in high schools are multifaceted. In particular, how teachers support theme-setting and students' autonomous problem-solving activities has been a common challenge both in the past and in the present. One contributing factor to these challenges at the time was the limitations in terms of "tools and environments". Unlike today, individual devices for each student were not available, and research-based learning often relied on limited media such as books and television. Although deep exploration was still possible, the absence of widely accessible internet made it difficult to acquire broad knowledge, identify problems, and pursue effective solutions. As a result, I myself struggled to pursue my own interests and curiosity. Today, however, the widespread use of the internet and ICT tools has provided

solutions to these challenges. With each student now having access to their own device, tools and resources for research have significantly improved. Compared to when I was a high school student, the changes in technological infrastructure have been remarkable.

Table 1: Comparison of Old and New Curriculum Guidelines

	Period for Integrated Inquiry	Period for Integrated Study
Learning Objectives	Develop the ability to identify and solve problems while reflecting not only on one's way of life but also on one's way of being.	Foster the ability to solve problems while reflecting on one's way of life.
Problem-Solving Process	Students encounter challenges they wish to solve and work independently to address them.	Teachers set the themes, and students engage in problem-solving.
Focus of Learning	Identify challenges while reflecting on one's way of being and way of life.	Reflect on one's way of life during the problem-solving process.

As illustrated in Table 1, the current Course of Study emphasizes autonomy in the "Period for Inquiry-Based Study". Students are required to identify problems and work towards solutions independently. Consequently, the role of teachers has shifted from "coordination" to a greater emphasis on "facilitation".

2. The Relationship Between Inquiry and Information Education
How can students effectively discover and solve problems? The utilization of individual devices plays a crucial role in this process. Of course, obtaining information from books remains important, and understanding the reliability of information from such resources is a skill that should be developed during elementary and secondary education. However, in situations such as "identifying problems" or "searching for prior research," leveraging individual devices enables more efficient and effective exploration of information. Furthermore, considering that inquiry activities take place in various settings, the use of the internet can significantly contribute to information collection.
The application of ICT tools is not only vital for information gathering but also plays an essential role in processing and presenting information. For example, when

creating surveys and conducting statistical analysis on the collected data, computers become indispensable. Recently, tools such as Google Forms and Microsoft Forms have made it possible to conduct electronic surveys, while statistical tools like Excel can be used for analysis, enabling efficient and effective inquiry activities. While this does not imply a preference for "inquiry without effort", the reality is that most schools allocate only about one hour per week for inquiry-based learning. Therefore, utilizing ICT tools, including individual devices, becomes essential. This also necessitates teaching students how to use these tools and how to process data.

3. The Relationship Between Inquiry and Information Science
The knowledge gained in high school Information Science courses is invaluable for deepening inquiry. The "Information I" and "Information II" subjects, introduced under the new Course of Study guidelines, are designed to practically teach information science with a focus on problem-solving. Specifically, Information I consists of four chapters: Chapter 1, "Problem Solving in the Information Society"; Chapter 2, "Communication and Information Design"; Chapter 3, "Computers and Programming"; and Chapter 4, "Information Communication Networks and Data Utilization. " Each of these units includes key elements that are essential for problem-solving and inquiry-based learning. In particular, Chapter 1, "Problem Solving in the Information Society", and Chapter 2, "Communication and Information Design", in Information I correspond to "problem identification" and "solution planning" in inquiry-based learning. Meanwhile, Chapter 3, "Computers and Programming", and Chapter 4, "Information Communication Networks and Data Utilization", include many elements that are valuable for learning inquiry methods. Statistical techniques within "Data Utilization" can be applied to inquiries across various fields.
Regarding "Data Utilization", the field is well-developed in areas related to statistics and data science. Students can learn academic skills such as statistical indicators, aggregation methods, regression analysis, and hypothesis testing. By processing "data" as scientific evidence, it is possible to conduct inquiries with a high degree of reliability.
In the next section, data analysis based on methods from "Information I" and "Information II" will be explored.