A Survey on Self-Perception of Institutional Research Skills and Knowledge by Focusing on the Gap with the Participants Needs of Training Courses

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Abstract

We conducted a web questionnaire survey to determine the need for training courses for institutional research in FY2021 and conducted individual surveys in FY2022. It was found that there is a need for step-by-step training sessions based on the abilities of the participants of these training courses. Moreover, we conducted an additional training course to determine the essential training for institutional research and the self-perceptions of the participants in FY2023. This paper reports on the background to the survey conducted at this additional training course and the results of the questionnaire survey conducted at this training course.

Keywords: Institutional research personnel training, Needs of training courses, Practical surveys, Questionnaires surveys

1 Introduction

In recent years in Japan, due to the economic downturn and decline in the population of 18-year-olds, universities and other institutions of higher education have needed to make effective use of their limited assets to sustain their respective institutions. Under these circumstances, there is a growing trend of utilizing internal data to objectively grasp the status of organizations. In response to this trend, higher education institutions have begun to establish institutional research (IR) functions and organizations to effectively utilize data; however, many IR practitioners struggle to understand how to carry out their tasks.

In anticipation of the shortage of IR personnel and skill development at Kyushu University, a class for graduate students was conducted from FY2013 to FY2016 under the name of "IR Human Resource Development Curriculum" [1][2][3]. This curriculum consisted of five courses with 10 credits based on the concept of the information support cycle [4] and was offered as an open curriculum so that not only graduate students but also faculty members and staff of other higher education institutions could take the course. In FY2018, many private universities established IR functions and organizations to respond to the IR points

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awarded under the Comprehensive Support Program for Reform of Private Universities [5]. Against this background, considering the increasing need for IR training courses, "Institutional Research Theory" has been offered at the Tokyo Institute of Technology starting in FY2019, with 16 classes [6][7]. We also know that these and other training opportunities have been implemented continuously since FY2015 [8][9].

Based on the hypothesis that while the number of IR practitioners is increasing, the needs for IR training courses will also diversify, a web questionnaire survey was conducted in FY2021 as "Questionnaire Survey for Developing Curriculum for Human Resource Development in Essential IR" to investigate what kind of training courses Japanese IR practitioners are attending and what kind of course content they need [10][11]. Here, "essential" does not mean formulating a curriculum by applying existing theories, but rather formulating a curriculum that is needed in reality after clarifying what IR practitioners truly think the problems are. Additionally, we selected several people from among those who responded "able to cooperate with individual surveys" to the web questionnaire and conducted individual surveys through interviews [12][13].

This paper describes the results of the web questionnaire survey and the individual surveys, as well as the outline of the training course and the results of the questionnaire surveys conducted to confirm these findings from the perspective that there may be a gap between the participants of the training course and the content of the training course based on the findings from these surveys.

2   Web Questionnaire and Individual Survey

2.1   Web questionnaire survey

A web questionnaire survey was conducted from July 1, 2021 to August 20, 2021 among Japanese IR practitioners to determine their needs regarding IR training courses [10][11]. Responses were solicited from approximately 900 people, including IR practitioners at 793 universities that existed throughout Japan as of June 2021, and members of the Japan Association for Institutional Research. In total, 189 responses, which is equivalent to a response rate of approximately 21.0%, were received. In the needs survey, respondents were asked to answer "Willing to participate," "Somewhat willing to participate," "Somewhat unwilling to participate," and "Unwilling to participate" ' for each of the following items. The "Willing to participate" and "Somewhat willing to participate," responses are expressed as "would like to take the course" responses.

The main questions and results of the training course are discussed below.

- When the need for the time of the event was identified by the combination of the number of classes and the number of days of the event, with the number of classes per day being one, two, or four and the number of days of the event being one, two, four, eight, or 16, the most common response was two classes per day and one day of the event. The number of responses was 162, equivalent to 86.7% of the 189 responses.

- Based on the information support cycle [4], we identified the needs for "Identification of issues and needs," "Data collection and accumulation," "Data reconstruction and analysis," "Data reporting," and "Decision making," and found that many respondents particularly would like to participate in the course, "Data reconstruction

and analysis." There were 184 responses, equivalent to 97.4% of the 189 responses. Practical studies on "data reconstruction and analysis" have been reported [14][15], and have attracted significant attention from IR practitioners.

- We also found that there were many responses regarding the desire to participate in courses related to "visualization" with regard to technical items. The number of responses was 171, equivalent to 90.5% of the 189 responses.

2.2   Individual survey

Respondents were also asked whether they could cooperate in the individual survey via the web questionnaire described in the previous section. The subjects of the individual survey were selected from 47 respondents who answered "yes" to this question, which was equivalent to 24.9% of 189 respondents. Paying attention to the distinction between faculty and staff and whether or not they had participated in any training courses on IR at least once in the past, six faculty members (two of whom had never participated in any training courses) and four staff members (one of whom had never participated in any training courses) were selected as the subjects of the survey [12][13]. In conducting the individual survey, we applied for and received approval for the Research on Human Subjects Review at Kyushu Institute of Technology's Learning and Teaching Center and the subjects agreed to become research subjects by submitting a research subject consent form. The needs regarding the content to be covered in future IR training courses were answered through interviews in this individual survey.

The following section describes the main requirements related to conducting training courses.

- In particular, university staff members indicated that a longer duration would make it difficult for them to participate due to their work commitments and that one night at most would be the maximum length of the course.

- Regarding technical training courses, there was a desire for training sessions tailored to their skill levels, and there were comments that it would be beneficial to have training sessions by class, such as advanced, intermediate, and beginner levels.

- Regarding the information support cycle, there is a need for training courses in analytical methods and visualization, as well as training to understand how to read data.

- Other needs included the need to interact and share feelings with others who participated in the training courses.

3   Outline of the Training Course

To summarize the main needs based on the web questionnaire survey and the individual surveys in the previous section, the needs can be summarized in the following statement: "Since the maximum length of the course is one night at most, we would like a class-specific course that is conducted for about two sessions per day and includes not only content on data reconstruction and analysis but also visualization, so that participants can understand analysis methods, visualization, and data reading methods, and can interact and share their feelings with others who have attended the course with them." In this case, it is conceivable to conduct class-specific training sessions using specific tools such as R and Python, but it

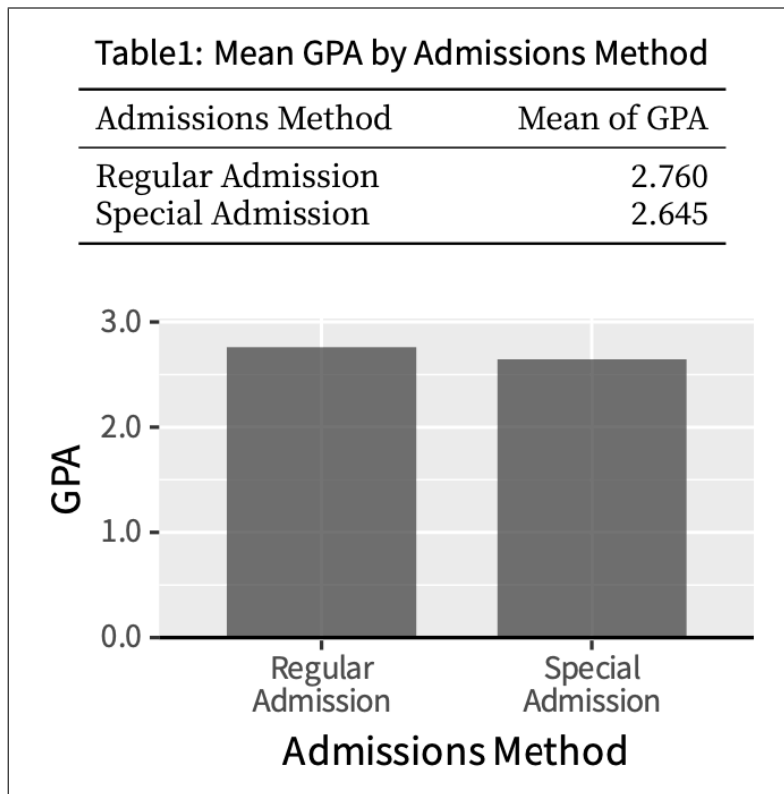| Table1: Mean GPA by Admissions Method	
Admissions Method	Mean of GPA
Regular Admission	2.760
Special Admission	2.645

Figure 1: Sample Handouts

proved difficult to design class-specific training sessions due to the lack of definitions such as what constitutes advanced training.

Therefore, we decided that the training course should be structured such that participants could check their own self-awareness of their own skills through the training course, and we arrived at the policy that "the training course should be held in a format that does not depend on specific tools" [16]. Then, we proceeded with the training course by presenting participants with one controversial chart at a time, while deepening their understanding through discussions in a group consisting of several participants on each chart, participants were provided with materials that gradually increased the amount of information or changed the method of expression as needed. For example, a combination of tables and figures, as shown in Figure 1, will be provided as handouts for the participants to discuss. In this training course, eight examples of materials using fictitious entrance examination data and seven materials using fictitious class questionnaires were prepared [17]. The training course proceeded with each theme.

The course participants were individuals engaged in IR work at universities and other higher education institutions. Since this training course was part of a research project, as with the previous individual survey, the Research on Human Subjects Review at Kyushu Institute of Technology's Learning and Teaching Center was applied for and approved, and participants were required to submit a consent form before attending the training course. Moreover, participants were required to respond to questionnaire surveys before and after the course.

This training course was conducted only in person. To meet the requirement of "two

classes per day over one night at most," the training course took place on August 4, 2023, at the Tokyo International Forum, with a bound time of about three hours in the afternoon. Additionally, to fulfill the condition of being able to interact and share feelings with those who attended the training course together, we set aside time not only for group work during the training course, but also for participants to talk freely with each other after the training course was over. The following program was used to complete the training course:

- Registration from 1:15 pm to 1:30 pm

- Explanation of purpose and ice break from 1:30 pm to 2:00 pm

- IR data visualization training from 2:00 pm to 3:45 pm

- Closing and questionnaire survey response from 3:45 pm to 4:00 pm

- Opinion exchange from 4:00 pm to 4:20 pm

Participants were asked to respond to a pre-survey on their self-perception of their skills in the following categories: "not in charge," "beginner," "middle between beginner and intermediate," "intermediate," "middle between intermediate and advanced," and "advanced."

- Data collection and accumulation

    – Data collection such as planning and implementation of questionnaire surveys
    – Data organization such as inter-departmental coordination of data collection
    – Data accumulation such as database or cleansing

- Data reconstruction and analysis

    – Data processing and preprocessing, such as the extraction transform load (ETL) tool or data extraction
    – Data analysis such as statistical estimation, testing, or multivariate analysis
    – Data visualization such as graph creation

- Data reporting

    – Data reporting such as report writing or data description

In the post-lecture questionnaire, the participants were asked to indicate the degree of difficulty ("Easy," "Somewhat easy," "Neutral," "Somewhat difficult," and "Difficult") for each example presented during the training. Moreover, for each method of expression, respondents were asked to answer "yes" or "no" to the following questions: "Did you know this method of expression," "Did you discover anything new when you heard this method of expression," "Can you realize this method of expression or have you already realized it?" and "Would you like to realize this method of expression?" Besides these questions, the level of satisfaction ("Satisfied," "Somewhat satisfied," "Neutral," "Somewhat dissatisfied," and "Dissatisfied" on a 5-point Likert scale) was asked regarding the overall training course, the date and time, and the location of the training course, respectively. Finally, the same questions as in the pre-survey were asked about the participants' self-perceptions. This study aimed to observe whether there was any difference in the participants' self-perception of their skills before and after the training course. Because these questionnaires were very large, participants were required to carry a personal computer and were asked to write their answers to the questionnaire survey each time during the training course, and then answer the questionnaire surveys on the web at the end of the course.
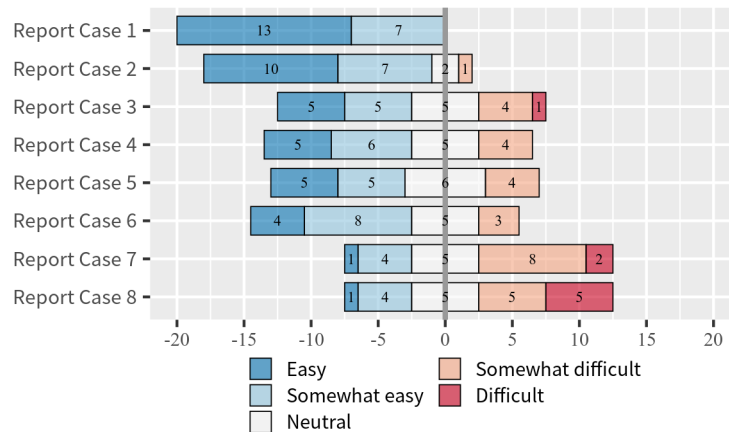
Figure 2: Report Case Difficulty

4 Results and Discussion of the Training Course Questionnaire Survey

The questionnaire survey described in the previous section was conducted in this training course. Twenty participants attended the training course, and their responses were received from all 20. This section discusses the questionnaire results.

4.1 Report case difficulty

The level of difficulty regarding admission data reporting cases is shown in Figure 2. It can be read that the difficulty level gradually increased for the participants as the number of example documents increased. This was expected, as later reported cases were more informative and complex.

4.2 Representation of report case

Figure 3 shows the results of the survey of admission data reports. As the level of difficulty increases, the number of respondents who answered "yes" to "I can implement this method" and "I'm familiar with this method" for each method of expression gradually decreases, while those who answered "yes" to "I want to implement this method" and "I had a new discovery" increase. The number of respondents who answered "Yes" to the questions "I can implement this method" and "I'm familiar with this method" decreased significantly for the report cases 7 and 8 in particular, which may indicate that many participants encountered barriers in IR practice that were difficult to overcome with their own knowledge alone.

4.3 Satisfaction with the training course

This training course was not intended to be a technical course, but rather a flow that would allow participants to gradually increase their understanding through discussion, which was expected to divide opinions. However, participants were generally satisfied not only with the overall course but also with the date and time of the event and the venue of the course. Satisfaction with the training course is shown in Figure 4.
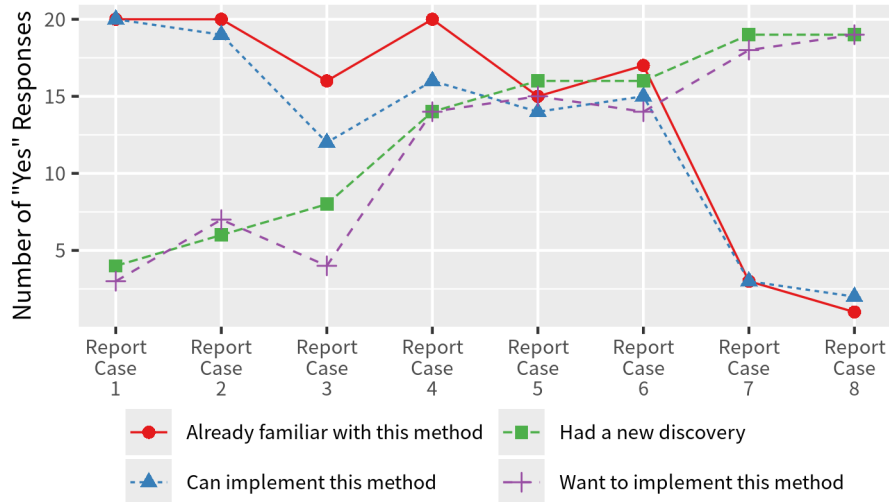
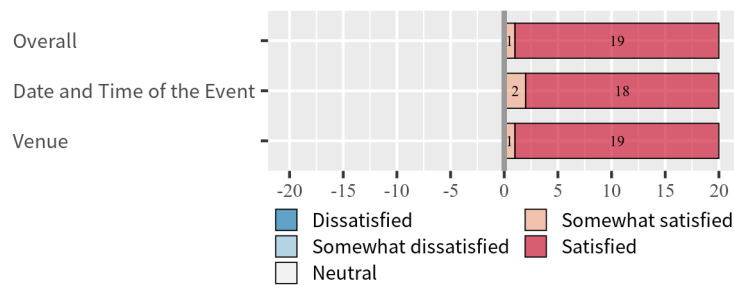Figure 3: Representation of report case

Figure 4: Satisfaction with the training course

4.4 The change in the perception of skills before and after attending the training course

The participants were asked about their self-perception of their skills before and after the training course. The survey, the results of which are shown in Figure 5, asked about the status of those whose self-perceptions of their skills for each item decreased, did not change, or improved before and after the training course. The scores for "not in charge," "beginner," "middle between beginner and intermediate," "intermediate," "middle between intermediate and advanced," and "advanced" were assigned on a scale of 1 to 6, with a negative difference indicating a decrease, a zero difference indicating no change, and a positive difference indicating an improvement. The scores for all items remained approximately the same for participants in the faculty, while those for participants in the staff swung between decrease and improvement. In particular, there were differences in self-perceptions regarding "Data Analysis," "Data Visualization," and "Data Reporting," which are similar to the content of this training course.
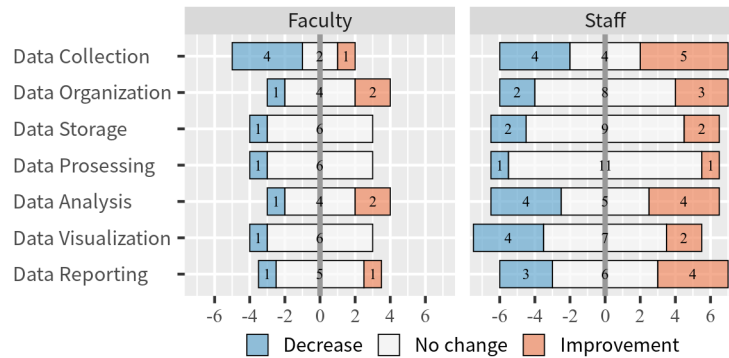
Figure 5: Change in perception of own skills before and after attending the training course

5   Discussion

In this study, we surveyed the gap between participants' self-perceptions and the content of the training course. Many of the participants changed their self-perceptions before and after attending the training course, but there were also some new discoveries for those in charge of IR. We were able to collect valuable data for the future development of an essential IR curriculum. However, this approach has certain limitations. The problems with this training course, their solutions, and future developments are described below.

5.1   Problems

The training course was conducted with 20 participants. However, the following problems were identified:

1. It was too small to ensure the credibility of the data. To increase the credibility of the data, it will be necessary to recruit a larger number of participants [18].

2. It is also possible that prospective participants misunderstood that the content of the training course used specific software.

3. Insufficient information on the attributes of the participants in this training course was obtained; thus, an in-depth analysis was not possible.

5.2   Solution

The following are possible solutions to the problems outlined in the previous section.

5.2.1   Setting the subjects

The reason for the small number of participants may be the setting of the subjects. This training course was not open to everyone but only to those who were practicing IR at universities and other institutions of higher education. This was intended to help those who struggled with IR work. The number of participants seemed to have decreased because those who did not meet these conditions were not allowed to participate in the training

course. Thus, it is necessary to increase the number of participants by deregulating the conditions for participation.

Furthermore, the participants in this training course were approved for the Research on Human Subjects Review at Kyushu Institute of Technology's Learning and Teaching Center, and the participants submitted and signed a consent form before attending the training course. This form required the participant's name, age, gender, occupation, and handwritten signature, and the time and effort required to submit this form may have prevented the participant from participating in the training course. Therefore, we propose that instead of submitting a separate form, the consent should be prompted on the web form used at the time of application for participation. This will not only save the time and effort of submitting the form but will also allow us to send information about the training course only to those who have given their consent. A reduction in the number of steps taken to participate in the training course is expected to increase the number of participants.

5.2.2   Clarification of course content

This training course was called the "IR Data Visualization Training Course." Some who intended to participate the training course were led by the term "IR Data visualization" and assumed that they would be using a specific tool such as the statistical analysis software R [19]. Therefore, some decided not to participate, particularly in the R training course.

Before conducting the training course, it is necessary to explain what is to be done in this situation, in accordance with Section 3. It is also necessary to identify a training course that indicates the content of the training course.

5.2.3   Setting up questionnaire survey questions

In this training course, we conducted a questionnaire survey to learn about the divergence of the participants' self-perceptions, as explained in Section 3. However, because we were not able to obtain sufficient information from the participants themselves, we lacked the ability to analyze the results from various angles.

The following items were asked about participants' own information during the training course:

- Attribute

    - Belonging

    - Distinction between faculty and staff

- Media through which you learned during the training course: Select more than one of the following:

    - Japan Association for Institutional Research [20]

    - Tulip Mailing List [21]

    - Introduced by organizer/lecturer

    - Introduced by an acquaintance

- Reason for attending: select more than one from the following

    - Self-enlightenment

- Because it is necessary for my work

- Superiors' orders

- Personal interest

- Recommended by an acquaintance

- Skill improvement

- Gathering information

- Attended IR-related training courses, classes, or past events: Select more than one of the following:

  - University Evaluation and IR Managers Meeting (University Evaluation Consortium from 2010) [22]

  - Meeting on Japanese Institutional Research (MJIR from 2012) [23]

  - University IR Human Resource Development Curriculum (Kyushu University from 2013 to 2016) [1][2]

  - University IR Intensive Course (Kyushu University, MJIR, and Tokyo Institute of Technology from 2014) [1][2]

  - Institutional Research Theory (Tokyo Institute of Technology form 2019) [7]

  - University IR Professional Development Course (Bizup Research Institute Inc. from 2021) [24]

The following items are considered to be lacking in these areas.

- Years of work experience

- Full-time or part-time

- Number of IR practitioners at each university

5.3   Future Development

Although it would be possible to ask the additional questions considered in Section 5.2.3 to the participants of this training course again, we will hold a similar training course again, considering the small number of participants to begin with. In conducting a new training course, the points explained in Sections 5.2.1 and 5.2.2 should be considered. In the future, we will conduct this new training course to develop an essential IR curriculum based on more precise data analysis.

Acknowledgments

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