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A Study of the Relationship between Learning in a Professional Seminar and its Workplace Application for Graduates of a Social Sciences Laboratory

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Abstract

This study examined the relationship between learning obtained in seminar activities, such as professional education, and applying that learning at work by conducting a correlation analysis of 148 graduates of a social science undergraduate laboratory at a regional public university in Japan. The results showed that "working skill," "collaborative problem-solving skill," and "making arrangements and stepping forward skill" were not significantly correlated with work situations. The following skills were found to be significantly related to work situations. "Communication skill" were positively correlated with work situations, such as "coordinating with other workers" and "cooperation with others," suggesting that these skills are useful in jobs where interpersonal relationships are important. "Team management skill" was positively correlated with "managing complex tasks," indicating that it is an important skill for engaging in work, but negatively correlated with "coordinating with other workers," suggesting that it may not be suitable for external coordination work. Finally, "interviewing and video editing skills" were negatively correlated with work situations such as "efficient work execution," suggesting that creative work has aspects that conflict with work efficiency.

Keywords: Educational Effect, Graduates, Higher Education, Professional Seminar

1 Introduction

Understanding the outcomes of higher education is known as college impact research [1]. College impact research uses the I-E-O (inputs-environment-outcome) model as its theoretical framework, focusing on the learning outcomes and growth that students achieve through university education. Yamada's (2010) research on Japanese university education is the most representative study that uses this model [2]. Currently, research using this model to understand the outcomes of Japanese university education continues to advance [3].

While most college impact studies focus on the development of students at universities, there are also efforts to understand the significance of higher education by targeting graduates, as it has long-term effects. The fields of educational sociology, pedagogy, and business administration have targeted graduates who have become workers. Additionally, in the field of pedagogy, Yano (2009), in a survey of Japanese engineering graduates, proposed the "practice of learning" hypothesis, which states that learning and reading habits cultivated during college affect subsequent continuous learning behavior and income [4]. This research proposes that learning at university indirectly affects working people's growth after university graduation. Hamanaka

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(2012) studied working people who graduated from the department of liberal arts and found that the benefits of a university education appear at an older age for those who graduate with liberal arts backgrounds [5].

Previous research suggests that the utility of a university education depends on the awareness and abilities cultivated in the process of learning. However, previous studies have failed to clarify what kind of awareness and abilities are cultivated in the process of learning, and how these abilities are utilized in working situations. In Japan particularly, the graduates of the department of liberal arts often work in fields that have little to do with their field of specialization. Clarifying how liberal arts graduates apply their university education to their careers will help us understand the significance of specialized education at the department of liberal arts, which will be useful in designing future curricula. From this perspective, we conducted a survey of graduates in a social science department and analyzed what they learned in the laboratory and how they applied those learnings in their workplaces [6]. This study conducted a new examination of the relationship between what they learned at university and how that learning is applied in the workplace. This paper reports the results.

2 Samples and Survey Effects

2.1 Samples

The research subjects were graduates of a laboratory belonging to the social science faculty of a public university in a regional city in Japan. In this faculty, students belonged to the same laboratory from the second semester of their second year until graduation. They also attended seminars. The same faculty member supervised the students until they wrote their graduation theses in their fourth year. In this laboratory, students studied theories on regional revitalization, frequently conducted fieldwork in the region, edited photographs and videos collected during fieldwork, and used these materials to support the information dissemination activities of local governments and other organizations. Because of the nature of the laboratory, students often collaborated with the local people of the region. However, there were also students who focused on content (videos, etc.) production without much contact with local people. Another characteristic of this laboratory was that, in principle, all educational activities were conducted as group activities. Each time a group was formed, a leader was elected. Since groups were formed with different members for each activity, everyone was given the opportunity to gain leadership experience and learn group management.

The survey targeted 172 of the 201 students who graduated from this laboratory between March 2007 and March 2022, for whom contact information was available. A total of 172 graduates were contacted individually and asked to complete the survey. The survey was conducted online between December 1 and 18, 2022. The questions relevant to this study were, “What experiences and learning did you gain from the laboratory activities?” and “In what situations did the learnings help you in your work?” In the following section, the open-ended responses to the former question will be labeled “experiences and learning,” while the latter will be simplified as “useful situations.”

2.2 Results

A total of 172 graduates were asked to complete the survey, and 148 of them responded (86% response rate). Respondents represented 73.6% of the total number of laboratory graduates

(201). The participants' ages at the time of response ranged from 22 to 40 years (Figure 1). The number of respondents was small for the oldest age group, but the rest were uniformly distributed among a diverse range of working people, from newcomers to mid-career professionals. Their occupations were also diverse.

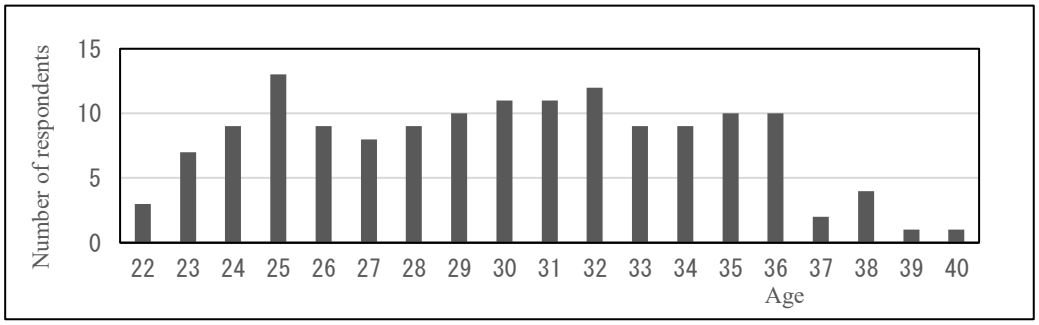

Figure 1: Age distribution of respondents

All 148 graduates responded to the free description, "experiences and learning," and the number of characters (in Japanese) in their responses was a maximum of 1,476, a minimum of 3, and an average of 134. In addition, 141 responded to the free-answer question, "useful situations," and the maximum number of characters (in Japanese) was 1,079, the minimum was six, and the average was 123.5. Topics were extracted through analysis using a structural topic model [7] developed in a previous study [6]. Table 1 presents the results of the study. Table 1 shows the topic proportion and topic label for each of Topic A from "experiences and learning" and Topic B from "useful situations."

Table 1: Topics extracted for "experiences and learning" and "useful situations"

Topic A from "experiences and learning"			Topic B from "useful situations"		
Topic	Proportion	Label	Topic	Proportion	Label
A1	0.173	Working skill	B1	0.119	Practical situations of information transfer
A2	0.128	Team management skill	B2	0.147	Coordinating with other workers
A3	0.120	Interviewing and video editing skill	B3	0.184	Managing complex tasks
A4	0.242	Collaborative problem-solving skill	B4	0.134	Cooperation with others
A5	0.193	Communication skill	B5	0.207	Proactive response to work
A6	0.145	Making arrangements and stepping forward skill	B6	0.210	Efficient work execution

Topic A, which was extracted from the "experiences and learning" section, revealed that

graduates referred to general skills in their free descriptions. However, Topic A3 (interviewing and video editing skills) is not generic but a specialized skill acquired in their laboratory; among the many specialized studies, this left a strong impression on the graduates. In Japan, graduates of social science departments tend to work in jobs that are not related to their specialized fields, compared to science departments. The graduates of the laboratory surveyed fell into this category. The results in Table 1 suggest that learning generic skills, rather than specialized learning, is important for social science undergraduates, who often work in jobs that are weakly related to their specialty.

Within Topic A, a high percentage of respondents referred to Topic A4 (collaborative problem-solving skill), A5 (communication skill), and A1 (working skill). Because the responses were given in the context of employment, it can be assumed that the experiences and learning identified by the topics were the learning that working people considered important at the time of the survey. If so, working people consider that the skills learned in university are useful when working with others. Table 1 suggests that they feel that interpersonal skills are important to learn.

In Topic B, which was extracted from "useful situations," the highest percentage was found in Topic B6 (efficient work execution). Next, was for Topic B5 (proactive responses to work) followed by Topic B3 (managing complex tasks). Graduates may connect these work situations to their laboratory activities and learning.

3 The Relationship between the Topics "experiences and learning" and "useful situations"

The same respondent answered the free-response statements "experiences and learning" and "useful situations." Therefore, we believe that there is a relationship between Topics A and B in Table 1, as extracted from these statements. This relationship was examined using a correlation analysis.

The topics were extracted as composition ratios, and the sum of the topic proportions was 1. The proportions of each topic are relative to each other. If the proportion of one topic increases, the proportion of the others decrease. When performing a correlation analysis on such constrained data, spurious correlations may occur. Therefore, we examined the relationship between Topics A and B with careful interpretation. As this was a correlation analysis, the results did not reveal a causal relationship between the two topics. It should be noted that the results do not reveal a causal relationship between a particular experience or learning and a particular work situation.

Table 2 presents the results of the correlation analysis for the 36 pairs of Topics A and B. The BH method was used to correct for multiple comparisons while simultaneously examining the significance of several correlation coefficients. A corrected p-value of less than 0.1 was considered statistically significant, and correlation coefficients that were not significant were denoted with "-" in the table, and their numerical values were omitted.

One of the characteristics of Table 2 is that Topics A1 (working skill), A4 (collaborative problem-solving skill), and A6 (making arrangements and stepping forward skill) are not significantly correlated with any of the work situations. The topic proportion of A4 was 0.242, as shown in Table 1, which was the highest proportion, but was not significantly correlated with every work situation. Topic A1 may not relate to any specific work situation, although it is a skill that everyone should possess as a member of society. Topic A6 indicates that when targeting a diverse group of graduates, it is occasionally important for them to make their own arrangements

and proceed with work. In other cases, it was sufficient for them to work within the scope of their supervisors' instructions.

Table 2: Correlation coefficients between the topics "experience and learning" and "useful situations" ($p<0.1$)

Topic	B1	B2	B3	B4	B5	B6
A1	-	-	-	-	-	-
A2	-	**-0.24**	**+0.25**	-	-	-
A3	-	-	-	-	-	**-0.23**
A4	-	-	-	-	-	-
A5	-	**+0.23**	-	**+0.23**	-	-
A6	-	-	-	-	-	-

Topic B1 (Practical situations of information transfer) and B5 (Proactive response to work) showed no correlation with any of the "experiences and learning" at university. In these work situations, any learning acquired at university is useful for some people, while not for others.

However, significant correlations were found between learning at university and performing in the workplace. Although all the correlations were weak, the following five correlations were found:

(1) Topics A5 (communication skill) and B2 (coordinating with other workers): Positive correlation
(2) Topics A2 (team management skill) and B2 (coordination with other workers): Negative correlation
(3) Topics A2 (team management skill) and B3 (managing complex tasks): Positive correlation
(4) Topics A5 (communication skill) and B4 (cooperation with others): Positive correlation
(5) Topics A3 (interviewing and video editing skill) and B6 (efficient work execution): Negative correlation

Correlation (1) indicates that graduates who were more likely to describe Topic A5 as a skill learned in university seminar activities were more likely to describe Topic B2 as a situation in which it was useful at work. Topic B2 requires coordination with other departments or people outside the company. In coordination work, it is necessary to listen to the opinions of others and build a consensus while empathizing with them; it is difficult to perform coordination work by simply conveying information one way or another. However, this relationship is correlational, as mentioned previously. It is not clear whether learning about Topic A5 has a direct impact on Topic B2. However, these two topics were extracted from the questions "What experiences and learnings did you gain from the laboratory activities?" and "In what situations did the learnings

help you in your work?" respectively. Given the relationship between these two questions, it is possible that graduates think Topic A5 is a useful skill in Topic B2 work situations. Correlation (4) also indicates that Topic A5 is positively correlated with Topic B4. Graduates believe that "communication skill" is an important skill for working with those close to them in the same department. Correlations (1) and (4) suggest that graduates consider the communication skill they learned at university useful in work situations that require interaction with others such as other departments, people outside the company, or people close to them in the same department.

Correlation (2) shows that Topic A2, a team management skill in the form of leadership and self-direction, conflicts with Topic B2, a situation in which the participants coordinate with those involved. However, correlation (3) confirms that Topic A2 is positively correlated with Topic B3. In complex work, it is important to manage a team smoothly. Therefore, it can be assumed that graduates consider Topic A2 a useful skill in such situations.

Correlation (5) indicates that Topic A3 is negatively correlated with Topic B6. Video editing is a skill that requires time to create excellent content. These results indicate that the skills required for efficient work are inversely related to interview and video editing skills.

4 Conclusion

In this study, 148 graduates from a social sciences undergraduate laboratory, ranging in age from 22 to 40, were asked to respond to free-response questions about the skills they learned in their laboratory seminar activities (A) and how useful those skills were in their work situations (B). We examined the correlation between Topics A and B, which were extracted from each free description, using a Structural Topic Model. The results showed that Topic A, "working skill," "cooperative problem-solving skill," and "making arrangements and stepping forward skill," did not correlate significantly with Topic B. Topic B, "practical situations of information transfer" and "proactive response to work," did not correlate with any Topic A extractions.

Certain correlations existed between Topics A and B for survey respondents. One of the results was that Topic A, "communication skill," was positively correlated with work situations such as "coordinating with other workers" and "cooperating with others." The importance of communication skill is well established. The study clarified how this skill is related to work situations. Another result was that "team management skill" in Topic A had a positive correlation with "managing complex tasks" at work, but a negative correlation with "coordinating with others" at work. This result suggests that team management skills are important as organizational management skills for work execution; however, they are not suited for coordination work with external parties. Finally, Topic A, "interviewing and video editing skill," was negatively correlated with "efficient work execution." This suggests that creative skills may be at odds with efficient work execution, and that different skills need to be used.

The results described herein are based on a case study of a single laboratory in a social sciences department. Therefore, it is difficult to generalize these results. However, these results provide some insight into the relationship between the skills developed in professional education in liberal arts faculties and the work settings in which they are used. In particular, the results are significant because they show specific relationships between generic skills, such as communication skill and team management skill, regarding the work situations in which they are effective or contradictory. In Japan, where students with liberal arts backgrounds often work in fields that have little to do with their field of specialization, this study may offer useful suggestions for designing educational curricula for liberal arts faculties. Future studies need to increase the sur-

vey sample and conduct more detailed analyses by age group and occupation, as well as develop the study into an analysis of the causal relationship between learning and work.

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