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Effects of Career Change Opportunities for Graduates After Graduation from an Educational Institute

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Abstract

In modern society, where drastic transformations of social structures are occurring, relearning new knowledge and skills for adults is becoming progressively vital thanks to the widespread proliferation of various educational methods. Under these circumstances, our study aims to analyze the underlying factors of study motivation of adult learners. To reveal the factors and relationships between before enrollment and after graduation, we performed multivariate analysis on a questionnaire targeted at general adult learners. Based on these observations, we created a questionnaire aimed at the graduate students of our affiliation. Factor analysis has yielded five factors reflecting the curriculum of our institute. Besides the questions analyzed in our previous work, we also posed a question about usefulness for work, which could be an important clue to evaluating the effectiveness of our curriculum. Therefore, in this paper we performed cluster analysis to examine the tendency in the graduates' career changes after graduation. In executing cluster analysis, three sets of feature values were analyzed with four clusters. As a result, it can be suggested that among clusters with high competence, the entire opposite groups can be observed; that is, some graduates stay in the same organizations as before, while others seek new environments.

Keywords: adult learner, cluster analysis, k-means, questionnaire

1 Introduction

Nowadays, the importance of learning new knowledge and skills through recurrent education has been highly emphasized, because of dynamic alternation of social structures, such as globalization, technological information, declining birthrate, aging population, etc. [1, 2]. Recurrent education is defined as periodic returns to systematic learning by workers, unemployed, retired people, or those who have plenty of leisure time [1]. These people can collectively be called "adult learners." Their motivations are driven by manpower issues, social, political and cultural factors, and the desire for self-realization [3]. This education system has enabled adult learners to retain their competitiveness throughout their lives and seek new career opportunities. From these backgrounds, it is becoming more important to grasp the motivation to learn and to define the obstructing factors of adult learners.

There are a broad range of study motivation and individual objectives for adult learners: some may seek a career advancement opportunity through learning specialized knowledge and receiving degrees; some may be looking for new career paths; some may just embrace academic interests for self-realization. Compared to other countries, however, recurrent education of adult

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learners in Japan has yet to become pervasive. The Ministry of Education, Culture, Sports, Science, and Technology reported typical obstructing factors to learning for adult learners as follows [4]: "Learning fee is too costly," "Too long working time discourages me from studying," "I cannot get curriculum suitable for me," etc. Many working adults manage to balance both work and home life. Especially for those above mid-level positions, the increased responsibilities of their career and daily life hinder their studying time. Moreover, time constraints as well as apprehensions about study achievements are also regarded as sources of concern for adult learners. Hence, insecurity of how such achievements would be mirrored in their post-career could also be obstacles to their continuous study [5].

Despite the existence of such institutional and life-related constraints, in modern society, recurrent education is gradually being focused on, and adult learners tend to choose studying as a means to advance their careers as well as to actively manage their career development [6]. Enhancing self-sufficiency in study, seeking promotion in their workplaces, and earning new career opportunities are influential motivations for adult learners [7]. In addition, the widespread proliferation of educational methods, e.g. online education and blended education, is one of the factors encouraging adult learners to relearn as well [7].

Despite previous literatures on study motivation and continuous study of adult learners, to the best of our knowledge, there is yet no research focusing on the alterations between before enrollment and after graduation. Therefore, our study aims to comprehensively analyze the study motivation of adult learners and factors for continuous study and to clarify those latent factors. We also aim to reveal what furthers or hinders their relearning and continuous study activities. Our study was started by performing multiple regression analysis and factor analysis on a questionnaire aimed at general adult learners who graduated from college or graduate school [8, 9]. It was suggested that the questionnaire would be effective in revealing those effects and changes [8, 9].

Based on the observations from the questionnaire targeted at general adult learners [8, 9], it would be dispensable for us to investigate the graduate students of our institution in order to examine and measure our curriculum. Therefore, our next principle is to survey the inherent factors of what our graduate students have learnt or acquired [10]. Firstly, we created a questionnaire aimed at our graduate students [10]. Through factor analysis performed on our questionnaire, five factors were obtained, indicating the unique structures of the curriculum at our institute. It was also shown that these factors suggest how they used it after graduation as well as what our graduate students learnt and acquired [10].

However, how such competence structures are manifested in graduates' post-graduation career behavior requires further theoretical consideration. From the perspective of lifelong learning, educational experiences are understood to foster individuals' ability to obtain, maintain, and develop their careers across changing work environments. In this context, career behavior can be viewed as a process of adaptation to environmental change, and patterns of career mobility—such as remaining within the same organization or moving across organizations—can be interpreted as observable behavioral expressions of such adaptability.

Among the various possible post-graduation outcomes, this study focuses on career mobility as a visible behavioral indicator of adaptation to changing labor market conditions. Aside from the questions already analyzed in our previous works [10], we therefore posed the question: "How many times have you experienced career changes after graduation?" In this study, cluster analysis is conducted using combinations of competence-related variables and the reported number of

career changes in order to explore graduates' career mobility patterns. Accordingly, this paper aims not to predict career changes, but to explore heterogeneous patterns of career mobility among graduates and to examine how these patterns relate to the competence acquired through graduate education. By applying cluster analysis, this study aims to clarify how graduates with similar competence profiles may exhibit contrasting career behaviors.

The rest of this paper consists of the following sections: Section 2 introduces the background of recurrent education and prior works about study motivation and continuous study. Our previous analysis performing multivariable analysis on the questionnaire aimed at general adult learners is summarized in Section 3. Section 4 then introduces the factor analysis on the one targeted at graduates of our institute. In Section 5, the results of cluster analysis are shown. Considerations toward the analysis results are provided in Section 6. Finally, Section 7 concludes the paper.

2 Background and Related Works

2.1 Recurrent Education in Japan

The Swedish 1968 Educational Commission Reports of 1969 and 1970 originally advocated the notion of recurrent education [11, 12]. The concept was introduced as a strategy to solve the issues facing higher education [11]. The commission developed the idea that this educational system should be acquired at a later age and during interrupted periods of full-time employment [12]. One of the objectives of this system was to meet certain purposes, e.g. diminishing the inequality in educational attainments among the generations, reinforcing the ideals among the community, etc. [12]. Based on these proposals, the Organisation for Economic Co-operation and Development (OECD) issued a report on recurrent education in 1973 [13]. Through these backgrounds, we can see that recurrent education gradually spread around the world.

In Japan, a policy of traditional promotion of recurrent education was adopted in the late 1990s [14]. The necessity of transforming the industrial structure beyond existing frameworks got to be recognized after the bubble economy burst in the early 1990s and the global financial crisis that would subsequently occur in 2008. Furthermore, there were increasing demands of relocation of labor between companies and industries [14]. Under these circumstances, employability was regarded as an important factor. This notion made it possible to advocate the importance of workers acquiring knowledge and skills across the boundaries between companies [14].

2.2 Factors of Continuous Study

When it comes to previous literatures on continuous study of adult learners, Miyoshi has emphasized that strong growth willingness and intention toward career development motivate learners to keep studying [6]. Receiving encouragement and support from their bosses and colleagues especially helped them study more diligently. Even without such assistance, the motivation of self-development greatly drives their need for continuous study [6]. Tsukahara and Hamana have indicated the importance of study support from cooperation [7]. Above all, it is indispensable to set up a system to have study achievement assessed so that adult learners can employ their study achievements at their workplace, resulting in career advancement [7]. Moreover, offering an environment where adult learners can reconcile study and work, e.g. lectures on weeknights or weekends, also impacts continuous study.

Based on the implications from these previous works, four hypotheses about study motivation and achievements of adult learners were shown to reveal factors that effects study motivation and achievement [8-10]; (1) Adult learners who feel what they learned at college or graduate school is directly related to their current jobs tend to highly assess their study achievements, (2) Adult learners who have achieved their targeted degree and qualification can be inclined to get their career goals such as promotion, pay raise, etc., (3) Connection with human networks and companions formed through learning at college or graduate school has a considerable effect on career and continuous study after graduation, and (4) Adult learners who feel strong engagement with college or graduate school even after graduation have high motivation to keep studying. From these diversified standpoints, our work aims to provide new insights that yields the improvement of study motivation and achievement of adult learners.

3 Analysis of Questionnaire Aimed at General Adult Learners

3.1 Outline of Questionnaire

To verify the four hypotheses stated in Section 2.2, this work was started through multivariate analysis using a questionnaire aimed at adult learners who received their diplomas in order to investigate the underlying effects and changes. The material analyzed was "Survey about Study Desire and Study Achievements of Businesspersons," which was provided by INTAGE [15], one of the biggest Japanese marketing survey and research corporations. Among the 19 main questions that compose most of the questionnaire, six questions about either before enrollment or after graduation were analyzed through multiple regression analysis [8] and factor analysis [9]. The numbers of subdivided questions for both before enrollment and after graduation were equally 37. These questions were five-level choice format (1: Agree, 2: Somewhat Agree, 3: Neither, 4: Somewhat Disagree, 5: Disagree). The number of valid samples without missing answers to the questionnaire was 107.

3.2 Multivariate Analysis Applied to Questionnaire

3.2.1 Multiple Regression Analysis

In order to observe the effects and changes between before enrollment and after enrollment of adult learners, multiple regression analysis was conducted on the 107 samples [8]. 37 subdivided questions about before enrollment were set as explanatory variables, while 37 subdivided questions about after graduation were set as respondent variables [8]. As an indicator of estimation accuracy of multiple regression analysis, the multiple correlation coefficient was obtained. Multiple correlation coefficient was larger than 0.8 for 28 out of the 37 respondent variables [8]. Therefore, it could be suggested that relationships could be observed between the questions on before enrollment and those on after graduation for adult learners. Additionally, it would be possible to indicate which feature values on before enrollment could impact those on after graduation. Through these procedures, the underlying effects and changes of adult learners could be related to the hypotheses explained in Section 2.2 [8]. It was also implied that the questionnaire aimed at general adult learners could be effective in surveying those effects and changes [8].

3.2.2 Factor Analysis

Factor analysis was performed with the questions on before enrollment and those on after

graduation separately [9]. In executing factor analysis, it is necessary to determine the number of factors. Here, the number of factors was set to 5. These five factors obtained were named according to their factor loadings with absolute values not less than 0.5. In comparison of the factors on before enrollment with those on after graduation, several sets were observed in common, such as new working environment [9]. On the other hand, several new factors were obtained for after graduation, such as the factors that indicate "Building connection with school" and "Fulfilling study period" [9]. It could be suggested that adult learners may not realize or perceive these two factors until they actually enroll in university or graduate school and graduate [9].

4 Factor Analysis of Questionnaire Targeted at Our Institute

4.1 Aim

As summarized in Section 3, a questionnaire provided by INTAGE was oriented to general adult learners across multiple educational institutions. Simultaneously, this sort of questionnaire would play an important role in clarifying the tendency of adult learners at one single institution. Thus, our next principle has been shifted to explore the latent factors dedicated to adult learners at our institute [10]. It would also be meaningful to compare the analysis results of our institute with those of INTAGE to see whether there are either similarities or differences [10].

4.2 Questionnaire Dedicated to Our Institute

4.2.1 Outline of Questionnaire

Firstly, creating a questionnaire about our institute must be required. Since it would be difficult for graduates to retrospectively view what they thought before enrollment, we set up questions about after graduation. The main questions analyzed are shown in Table 1. Their answer format is six-level choice (1: Totally Disagree, 2: Moderately Disagree, 3: Relatively Disagree, 4: Relatively Agree, 5: Moderately Agree, 6: Totally Agree). Then graduates who graduated in the recent decade were asked to answer the questionnaire through Google Form in February 2025. After the one-month survey duration, the number of answer samples analyzed was 178 after aggregation of the answers submitted [10]. As most of the questions were set as required, all the answer samples included the entire values.

Table 1: Main Questions of the Questionnaire Aimed at Graduates of Our Institute [10]

No.	Question Content
Ins_Q2	In retrospect of your study and attitude as a graduate student, to what degree do you think you acquired and understood knowledge?
Ins_Q3	In regard to the extent of exercising your competency in the actual world obtained through PBL, we would like to ask you about your abilities related to project fulfillment.
Ins_Q4	In regard to the extent of exercising your competency in actual world obtained through PBL, we would like to ask you about the ability related to adaptation to environment
Ins_Q5	Is what you have obtained during a graduate school useful enough to enrichen your life after graduation? (e.g. academic factors such as classes, lectures, PBL etc., extracurricular activities and friendship)

4.2.2 Factor Analysis

Firstly, the answers summarized in Table 1 were extracted and used for the subsequent analysis.

Here, feature values used for the analysis were main questions Ins_Q_2, Ins_Q_3 Ins_Q_4 and Ins_Q_5. Each question has subdivided questions. The numbers for I Ins_Q_2, Ins_Q_3 Ins_Q_4 and Ins_Q_5 are 14, 6, 5 and 4, respectively. In total, these 29 subdivided questions were utilized for factor analysis to extract the factors of what graduates acquired at our institute [10]. Similar to the previous factor analysis stated in Section 3.2, the number of factors was set to 5. By comparing the questionnaire about our institute with that provided by INTAGE, both questionnaires have common features of "acquisition of specialized knowledge" [10]. On the other hand, several factors specialized to our institute were observed as well, indicating that the questionnaire aimed at our graduates expresses unique structures that reflect the curriculum of our institute [10]. It would also be concluded that our questionnaire would indicate how our graduate students make use of what they learnt even after their graduation [10].

5 Career Change Opportunities for Graduates After Graduation

5.1 Principle

In addition to the questions already analyzed in our previous works explained in Section 4 [10], we also included questions about graduates, e.g. basic information such as what year they graduated, which course they belonged to, etc., or current occupation statue such as their workplace scale, job category, position, etc. Among these questions, we cast a spotlight on the following question about after graduation: "How many times have you experienced career changes after graduation?" For convenience, this question is denoted as Ins_Q_{cc}.

Analyzing this question might lead to revealing the effects of career change opportunities after graduates completed the curriculum at our institute. Hence, this paper aims to survey the tendency of our graduates' career changes after graduation. Here, we perform three trials of cluster analysis on a pair of questions, one of which is the question about career changes after graduation explained above. Through these analyses, we aim to reveal how graduates have benefited from what they have learnt or acquired at our institute.

5.2 Feature Values for Cluster Analysis

As explained in Section 5.1, we perform three trials through cluster analysis using a pair of feature values, one of which is the said question Ins_Q_{cc}. The scope of Ins_Q_{cc} ranges from -1 to 4. How to see this variable is follows

- $Ins\_Q_{cc} = -1$ indicates the graduate is unemployed; the attributes of these respondents are either a manager, an executive, or a student.
- $Ins\_Q_{cc} = 0$ means the graduate has not had career change opportunity and been staying at his/her workplace since their graduation.
- $Ins\_Q_{cc} = 1, 2, 3$ mean the graduate has either once, twice or thrice career change opportunities since their graduation.
- $Ins\_Q_{cc} = 4$ indicates the graduate has experienced career change opportunities at least four times.

The other feature values used are Ins_Q_3, Ins_Q_4 and $Ins\_Q_{5\_1}$ (a subdivided question of Ins_Q_5). As summarized in Table 1, Ins_Q_3, Ins_Q_4 and Ins_Q_5 indicate the questions about

ability, adaptation, and usefulness, respectively. The question $Ins\_Q_{5\_1}$ means the usefulness for work. The values of Ins_Q_3, Ins_Q_4 and $Ins\_Q_{5\_1}$ range from 1 to 6, since these questions are six-level format as explained in Section 4.2.1. The three cases of cluster analysis are as follows:

Case A: Cluster analysis using Ins_Q_{cc} and Ins_Q_3 [Career change and ability]

Case B: Cluster analysis using Ins_Q_{cc} and Ins_Q_4 [Career change and adaptation]

Case C: Cluster analysis using Ins_Q_{cc} and $Ins\_Q_{5\_1}$ [Career change and usefulness for work]

For Cases A and B, Ins_Q_3 and Ins_Q_4, since we regard ability and adaptation as overall competence related to career change opportunities after graduation, these values are averaged by the number of subdivided questions per sample. Taking an example of Ins_Q_3 (Ins_Q_4 respectively), as it has six (five) subdivided questions, the value of Ins_Q_3 is the mean of its six (five) subdivided questions. On the other hand, for Case C, as usefulness for work is considerably connected to career change opportunities after graduation, values of $Ins\_Q_{5\_1}$ are directly used, instead of taking the average of subdivided questions of Ins_Q_5. For all of these three cases, *k*-means is adopted as a cluster analysis, with the number of cluster *k* set to 4.

5.3 Analysis Result

Three trials of cluster analysis are employed using a pair of feature values, as explained in Section 5.2. Each case is as follows:

(I) Case A: Ins_Q_{cc} and Ins_Q_3 [Career change and ability]

Descriptive statistics of the four clusters are shown in Table 2. The columns entitled "Mean" and "Std" indicate mean and standard deviation of the cluster, respectively. The columns entitled "Min" and "Max" mean the minimum and maximum value within the cluster, respectively. *N* indicates the number of respective clusters. Moreover, the distributions of clusters are shown in Figure 1. The horizonal axis indicates Ins_Q_{cc}, whereas the vertical axis means Ins_Q_3. The clusters 1, 2, 3 and 4 are dotted as red circles, blue triangles, green squares, and brown rhombus, respectively. Notations of columns in descriptive statistics and what horizontal axis indicates as well as plot indications in the cluster distribution also apply to the remainder of the cases. Each sample is classified into either one of the following four clusters.

- Cluster 1: Clusters with graduates who showed moderate project ability and have had more career change opportunities.
- Cluster 2: Clusters with graduates who especially showed high project ability and who have not had career change opportunities or are unemployed.

Table 2: Descriptive Statistics of Clusters (Case A)

	Cluster 1 (N=35)				Cluster 2 (N=66)			
	Mean	Std	Min	Max	Mean	Std	Min	Max
Ins_Q_3	4.15	0.482	3	4.67	5.24	0.407	4.67	6
Ins_Q_{cc}	1.37	0.770	1	4	-0.091	0.290	-1	0
	Cluster 3 (N=40)				Cluster 4 (N=37)			
	Mean	Std	Min	Max	Mean	Std	Min	Max
Ins_Q_3	3.85	0.612	1.3	4.5	5.42	0.402	4.83	6
Ins_Q_{cc}	-0.100	0.304	-1	0	1.30	0.661	1	4

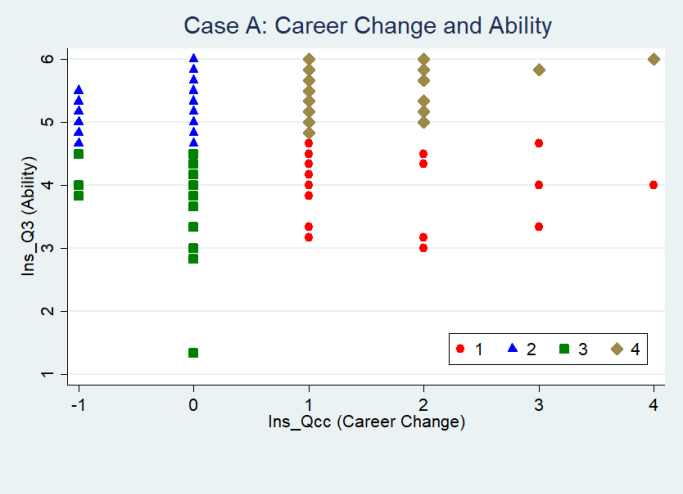

Figure 1: Distributions of Clusters (Case A)

- Cluster 3: Clusters with graduates who showed moderate project ability and who have not had career change opportunities or are unemployed.
- Cluster 4: Clusters with graduates who especially showed high project ability and have had more career change opportunities.

(II) Case B: Ins_Q_{cc} and Ins_Q_4 [Career change and adaptation]

Similarly, descriptive statistics of the four clusters are shown in Table 3. Distributions of clusters are shown in Figure 2. Each sample is classified into either one of the following four clusters.

- Cluster 1: Clusters with graduates who especially showed high adaptation and who have not had career change opportunities or are unemployed.
- Cluster 2: Clusters with graduates who showed moderate adaptation and who have occasional career change opportunities or are unemployed.
- Cluster 3: Clusters with graduates who especially showed high adaptation and who have repeatedly had career change opportunities.
- Cluster 4: Clusters with graduates who especially showed high adaptation and have had a change opportunity.

Table 3: Descriptive Statistics of Clusters (Case B)

	Cluster 1 (N=78)				Cluster 2 (N=43)			
	Mean	Std	Min	Max	Mean	Std	Min	Max
Ins_Q_4	5.21	0.463	4.4	6	3.57	0.608	1.4	4.2
Ins_Q_{cc}	-0.103	0.305	-1	0	0.326	0.606	-1	2
	Cluster 3 (N=15)				Cluster 4 (N=42)			
	Mean	Std	Min	Max	Mean	Std	Min	Max
Ins_Q_4	4.89	0.700	3.6	6	5.22	0.464	4.4	6
Ins_Q_{cc}	2.53	0.743	2	4	1.00	0.000	1	1

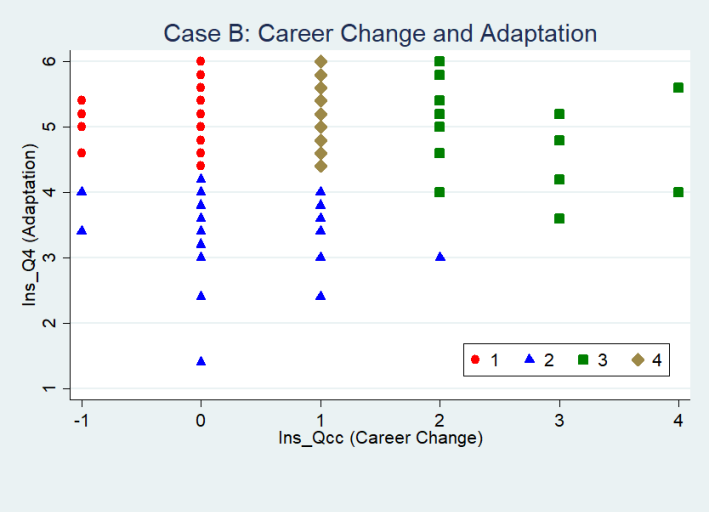

Figure 2: Distributions of Clusters (Case B)

(III) Case C: Ins_Q_{cc} and $Ins\_Q_{5\_1}$ [Career change and usefulness for work]

Descriptive statistics of the four clusters are shown in Table 4. Unlike Cases A and B where average values are regarded, the variable $Ins\_Q_{5\_1}$ possesses only integers, since its value is the answer as it is. Instead of plotting the distributions of clusters because it is difficult to comprehend how cluster is classified within the integers ranging from 1 to 6, the distributions of samples for each cluster are summarized in Table 5. Each sample is assigned to either one of the following four clusters.

- Cluster 1: Clusters with graduates whose experiences at our institute are useful for their work and who have repeatedly had career change opportunities.
- Cluster 2: Clusters with graduates whose experiences at our institute are greatly useful for their work and who have had a few career change opportunities.
- Cluster 3: Clusters with graduates whose experiences at our institute are useful for their work and who have seldom had change career opportunities.
- Cluster 4: Clusters with graduates whose experiences at our institute are extremely useful for their work and who are unemployed.

Table 4: Descriptive Statistics of Clusters (Case C)

	Cluster 1 (N=13)				Cluster 2 (N=112)			
	Mean	Std	Min	Max	Mean	Std	Min	Max
$Ins\_Q_{5\_1}$	4.00	1.35	2	4	5.56	0.50	5	6
Ins_Q_{cc}	2.61	0.77	2	6	0.46	0.52	0	2
	Cluster 3 (N=44)				Cluster 4 (N=9)			
	Mean	Std	Min	Max	Mean	Std	Min	Max
$Ins\_Q_{5\_1}$	3.30	1.07	1	4	4.67	0.70	4	6
Ins_Q_{cc}	0.21	0.46	-1	1	1.00	0.00	-1	1

Table 5: Distributions of Clusters (Case C)

Cluster 1 (N=13)

Useful for work	Career Change: -1	0	1	2	3	4	Sum
6	0	0	0	0	1	1	2
5	0	0	0	2	1	0	3
4	0	0	0	1	1	1	3
3	0	0	0	2	1	0	3
2	0	0	0	2	0	0	2
1	0	0	0	0	0	0	0
Sum	0	0	0	7	4	2	13

Cluster 2 (N=112)

Useful for work	Career Change: -1	0	1	2	3	4	Sum
6	0	34	26	3	0	0	63
5	0	29	20	0	0	0	49
4	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Sum	0	63	46	3	0	0	112

Cluster 3 (N=44)

Useful for work	Career Change: -1	0	1	2	3	4	Sum
6	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0
4	0	21	7	0	0	0	28
3	0	6	0	0	0	0	6
2	1	2	2	0	0	0	5
1	0	4	1	0	0	0	5
Sum	1	33	10	0	0	0	44

Cluster 4 (N=9)

Useful for work	Career Change: -1	0	1	2	3	4	Sum
6	1	0	0	0	0	0	1
5	4	0	0	0	0	0	4
4	4	0	0	0	0	0	4
3	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Sum	9	0	0	0	0	0	9

From Table 5, graduates with high scores in terms of career change opportunities are mainly classified into Cluster 4, while those with high scores for usefulness for work are mostly assigned to Cluster 2.

From the results of these three cases, it has been suggested that our questionnaire could reflect whether what graduates have acquired or learnt at our institute has been useful for their career change opportunities.

6 Considerations

It would be meaningful to interpret the clusters based on the cluster analysis results. For Case A (ability), it would be noteworthy to focus on clusters 2 and 4 that show higher project ability than clusters 1 and 4, as shown in Figure 1. Nevertheless, clusters 2 and 4 show the entirely opposite

tendency; namely, cluster 4 has graduates with multiple career change opportunities, while cluster 2 has those with no career change opportunities or are unemployed. This tendency holds for cluster 1 (career change opportunities) and cluster 3 (no opportunities or unemployed).

Similar tendency can also be observed in Case B (adaptation). In terms of higher adaptation above 4.0, as shown in Figure 2, cluster 3 has graduates with multiple career change opportunities, whereas cluster 4 has those with only one opportunity, and cluster 1 possesses those with no opportunity or unemployed. Therefore, from these cases, it has been clarified that the opposite groups can be observed across the clusters with high project ability and adaptation to environment; some just stay at their same organizations, while some seek new environments. In other words, it would be implied that high project ability and adaptation to environment alone do not necessarily connect to career change opportunities.

The tendency that high-scored assessments may not necessarily lead to career change opportunities also applies to Case C (Usefulness for work), where 157 out of 178 graduates scored at least 4 for the question about work. In terms of clusters with high-scored answers, for Case C, 112 graduates are classified into Case 2, where all of them scored either 5 or 6 on the question about usefulness for work. Most of them, however, have one or no career change opportunity. From this viewpoint, it has also been implied that, regardless of career change opportunities after graduation, graduates would benefit from what they acquired at our institute when it comes to their jobs and promotions.

7 Conclusion

To investigate the effects after graduates completed the curriculum at our institute, it would be a noteworthy to analyze a question, “How many times have you experienced career changes after graduation?” Hence, this paper aimed to survey the tendency of graduates’ career changes after graduation through cluster analysis. The results of the analysis indicated that exact opposite groups exist among the cluster with high competence; some just remain in their same organizations, whereas others seek different workplace environments. It has also been suggested that what graduates acquired or learnt at our institute would be useful for their jobs and promotions, regardless of their career change opportunities after graduation.

There are several requirements and future work that must be addressed. The validity and robustness of the analysis results ought to be investigated through further statistical methods. Among our questionnaire, the questions with multiple-choice answer types need to be analyzed to inspect further understandings of factors of study motivations of adult learners. Moreover, by combining longitudinal study and survey specialized to each institution, it can be expected to more deeply comprehend how study motivation and achievement of adult learners change over time and how to contribute to practical assistance and policy recommendation for adult learning. Additionally, the characteristics of adult learners, e.g. age, specialty, occupation, etc., should be taken into consideration as well. Besides, revealing the factors of what prevents adult learners from studying is also addressed as one of our future works. Since there still have been scarce researches that focus on working adults who go to graduate schools, integrating our work with those on lifelong learnings ought to be one of our objectives.

References

[1] Ministry of Education, Culture, Sports, Science and Technology "Researches about Understanding the Real Situation of Relearning at Colleges etc. of Adut Learners" (URL), https://www.mext.go.jp/a_menu/koutou/itaku/1371459.htm, 2016, Access: 2025-12-23.

[2] Annual Report on the Japanese Economy and Public Finance 2018, Cabinet Office (URL, in Japanese), https://www5.cao.go.jp/j-j/wp/wp-je18/pdf/p02023.pdf, 2018, Access: 2025-12-23.

[3] M. Jourdan, "What is recurrent education?," Western European Education, 1980, Vol. 12, No. 1, pp.38-44.

[4] Ministry of Economy, Trade and Industry, "Fundamental skills of an adult learner" (URL), https://www.meti.go.jp/shingikai/mono_info_service/mirai_kyoshitsu/pdf/002_s01_00.pdf, 2018, Access: 2025-12-23.

[5] Y. Liu, S. Ma and Y. Chen, "The impacts" of learning motivation, emotional engagement and psychological capital on academic performance in a blended learning university course," Frontiers in Psychology, May 2024, pp.1-12, DOI:10.3389/fpsyg.2024.1357936.

[5] K. Miyoshi, "Survey on the Background and Motivation of Adult Learners to Learn at University" (in Japanese), Bulletin of Advanced Institute of Industrial Technology, 2021, Vol.15, pp. 213–218.

[6] K. Miyoshi, "The Learning Motivation in Admission to Professional Graduate School for Adults of PBL Course Students" (in Japanese), The 68th Japanese Society for Engineering Education Annual Conference, 2020, pp. 246–247.

[7] S. Tsukahara and A. Hamana, "Adult Learning in Japan's University Education" (in Japanese), The Japanese Journal of Labour Studies, October 2017, Vol.687, pp.27-36.

[8] Y. Yokoyama, T. Hosoda, M. Ikemizu and T. Matsuo, "Investigation of Latent Effects and Changes of Adult Learners at Colleges or Graduate Schools", IIAI Letters on Institutional Research, Vol.5 (2025), 2025, pp.1-13, DOI: https://doi.org/10.52731/lir.v005.335.

[9] Y. Yokoyama, T. Hosoda, M. Ikemizu and T. Matsuo, "Extracting Factors of Before Enrollment and After Graduation from a Questionnaire Aimed at General Adult Learners", 30th IEEE/ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD2025-Summer II), 6 pages, Presented, 2025.

[10] Y. Yokoyama, T. Hosoda, M. Ikemizu and T. Matsuo, "Obtaining Factors of What Was Acquired through Questionnaire Aimed at Graduates of an Educational Institute", 18th International Congress on Advanced Applied Informatics (AAI 2025), 6 pages, Presented, 2025.

[11] K. Rubenson, "Recurrent Education Policy in Sweden: A Moving Target", International Review of Education, Vol. 40, No. 3/5, Lifelong Education (1994), pp.245-256, DOI: https://doi.org/10.1007/BF01257779

[12] M. Blaug and J. Mace, "Recurrent Education – The New Jerusalem", Higher Education, Vol. 6, No. 3, Aug. 1977, pp.277-299, DOI: https://doi.org/10.1007/BF00141369

[13] T. Simkins, "Recurrent Education: Some Economic Issues", Higher Education, Vol. 5, No. 4, Nov. 1976, pp. 363-376, DOI: https://doi.org/10.1007/BF01680074

[14] The Association for Overseas Technical Cooperation and Sustainable Partnerships: Lecture 2: Recurrent-education initiatives by the Japanese government (e.g., the Ministry of Health, Labor and Welfare and the Ministry of Education, Culture, Sports, Science and Technology) (URL), https://www.aots.jp/en/publications/hrm-ir/report92/, Access: 2025-12-23.

[15] INTAGE (URL), https://www.intage.co.jp/english/, Access: 2025-12-23.