

Investigation of Latent Effects and Changes of Adult Learners at Colleges or Graduate Schools

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Abstract

In contemporary society, where radical changes of social structures are being taking place, it is getting more important for adult learners to study to obtain new knowledge and skills. From these circumstances, what triggers adult learners to study and what prevents them from learning are greatly emphasized. There are several forms of study motivation: getting a certification, seeking new career paths, or simply academic interest, among others. However, Japan is behind other countries when it comes to adult relearning due to various hurdles along the way. Meanwhile, recurrent education is attracting attention along with the widespread use of various education methods to handle multiple demands. Therefore, this paper aims to analyze the potential factor of study motivation of adult learners and to grasp what motivates or prevents their relearning. As a first phase, we formulate four hypotheses regarding the relationships between study motivation and achievement. These hypotheses are then validated using questionnaire targeting adult learners. As a result of analysis, the relationships between before and after studying at college or graduate school can be observed. It could also be implied that the questionnaire targeting adult learners who completed college or graduate school would be effective in examining effects and changes.

Keywords: adult learner, multiple regression analysis, standardized partial regression coefficient

1 Introduction

In current society, the importance of adult learners studying at college or graduate school is being emphasized more than ever. In order to deal with rapid changes of social structures, such as globalization, technological information, and declining birthrate and aging population, it is essential to continuously learn new knowledge and skills from recurrent education in the course of one's career as adult learners [1, 2]. Recurrent education is defined as periodic returns to organized learning by workers, unemployed, retired people or those who have the necessary leisure time [3]. This enables adult learners to remain competitive throughout their lives and to advance their career. From these backgrounds, understanding the eagerness to learn and obstruction factors of adult learners is extremely prioritized.

There are diverse forms of study motivation for adult learners and their individual goals are various. There are those who aim for career advancement through learning specialized knowledge and ob-

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taining certifications, those who seek new career paths, or those who pursue their academic interests for self-realization. Nevertheless, compared to other nations, the relearning of adult learners in Japan has not been sufficiently popularized. According to surveys published by the Ministry of Education, Culture, Sports, Science, and Technology, major obstruction factors are represented by the following issues: “Learning fee is too costly,” “Working time is too long to secure enough time to study,” “I cannot find curriculum suitable for me,” etc. [4] When adult learners settle down to study, there are many cases where balancing both work and home life is challenging. Especially for those above mid-level, it is difficult for them to secure the time required in accordance with the increased responsibilities of their career and home life. It has been reported that time constraints can prevent adult learners from participating in study; some stated that they barely managed to commute between their homes and companies. In addition, anxiety about study achievements is also one source of trouble for adult learners. There are several positive experiences e.g. they become so confident as to think they still can do what they have learnt and felt through study. Nevertheless, the uncertainty of how such achievements would be reflected in their career could be obstacles to their continuous study [5].

Meanwhile, as the backgrounds of relearning of adult learners, strong self-growth willingness and awareness of career autonomy exist. In the present age, where recurrent education is drawing increasing attention, adult learners have a tendency to choose to study as the means to actively manage their career development as well as to merely advance their own career [6]. Enhancing self-efficiency in the course of study, aiming for promotion in their workplaces and obtaining new career opportunities are important motivations for adult learners [7]. In addition, the diffusion of education methods to adapt to the diverse needs of learners, such as online education and blended education, is also one of the factors prompting adult learners to relearn [7].

Despite broad research on education about adult learners, there are scarce preceding works on their study motivation. In addition, while prior researches exist about study motivation and continuous study of adult learners, to the best of our knowledge, no previous study has analyzed the changes of adult learners between before enrollment and after graduation. Therefore, the purpose of the study is to broadly analyze the study motivation of adult learners and factors for continuous study and to clarify those underlying factors. We also aimed to understand what drives adult learners to select relearning and what factors encourage or hinder continuous study activities. As a first phase of our study, based on the prior researches about study motivation and continuous study, we advocate four hypotheses about learning motivation and achievement. In order to verify these hypotheses, the answers to questionnaires aimed at adult learners who graduated from college or graduate school were analyzed. In performing multiple regression analysis, questions on before enrollment were set as explanatory variables, whereas those on after graduation were used as respondent variables. The analysis results imply that the relationships between before and after studying at college or graduate school could be discovered. Interpreting analysis results has also made it possible to associate potential effects and changes of adult learners with the hypotheses. It could be also suggested that the questionnaire would be effective in looking into such effects and changes.

The remainder of this paper is organized as follows: Section 2 introduces prior works about study motivation and continuous study. Based on these earlier works, suggestions and hypothesis are ad-

dressed in Section 3. The analysis using questionnaire is shown in Section 4. Considerations on the analysis results are provided in Section 5. Finally, Section 6 concludes the paper.

2 Related Works

Previous literature on study motivation and continuous study of adult learners is examined in this section. Firstly, it explores how career development, self-realization and market value improvement could impact on major motivations of their choice to relearn. Next, based on existing research, support systems from their workplaces and families necessary for continuous study are analyzed. Through these achievements, theoretic frameworks for the more profound understanding of study motivation and continuous study of adult learners are provided.

2.1 Factors of Study Motivation

Research on study motivation of adult learners have focused on three main motivations: career development, self-realization, and market value improvement. Miyoshi has revealed that acquiring specialized knowledge for career advancement is strong motivation when adult learners enroll in professional graduate school [8]. This reflects that adult learners have strong feelings about the necessity of learning specialized knowledge and skills to raise their careers to high level. Moreover, for students who desire for career change, relearning can often be an important phase to aim for success in their chosen new field.

Furthermore, studying for self-realization is a vital factor as well. Raising self-efficiency can also make adult learners feel their growth and function as redefining their role at the workplace. It has also been shown that successful experiences and study achievements at their workplace can be driving forces for tackling new challenges with confidence.

Tsukahara *et al.* have indicated that pursuing self-improvement through relearning is a vital factor for adult learners to enhance study motivation [9]. Above all, learning specialized knowledge at workplace and broadening their horizons drive adult learners to take up new challenges. Besides, through learning the latest skills and knowledge, they enhance employment stability and market value which also forms a part in increasing study motivation for adult learners. Assessments from corporations and companies function as a factor of reinforcing their study motivation.

2.2 Factors of Continuous Study

As factors affecting continuous study, Miyoshi has emphasized that strong growth willingness and intention toward career development prompts adult learners themselves to keep studying [8]. Especially, support from their bosses and colleagues help them to study more smoothly. Even without such support, the motivation to aim at self-development greatly influences the continuous study of adult learners [8]. Study support from workplace includes securing studying times, providing opportunities where study content is directly related to practical content, and positive assessment of learning. This enables adult learners to manage both study and work and to maintain study motivation. At the same time, domestic support does not necessarily form a factor directly linked to continuous study [8]. Despite insufficient understanding and cooperation from family, there are many

adult learners who continuously study so long as they have strong motivation to learn. Miyoshi has also pointed out that there could be no significant relationship between motivation to relearn and domestic support. This indicates that intention towards self-improvement rather than support from workplace or family could be a key to continuous study [8].

Tsukahara *et al.* have pointed out the importance of study support from cooperation [8]. Especially, they have emphasized that it is indispensable to establish a system to have study achievements assessed so that adult learners can make use of their study achievements at their workplace, resulting in their career advancement [8]. Furthermore, providing an environment where adult learners can balance both study and work, such as lectures on weeknights or weekends, is an approach that contributes to continuous study.

3 Suggestions and Hypotheses Based on Related Works

3.1 Suggestions from Related Works

As the prior research on study motivation and study achievement of adult learners is summarized in Section 2, it has been confirmed that career development, self-realization, and market value improvement function as major forms of motivation [8, 9]. Miyoshi has revealed that studying for the purpose of career advancement has strongly affected study motivation of adult learners [8]. On the other hand, Tsukahara *et al.* has pointed out that promotion of self-efficiency raises study motivation, which is a vital factor to enhance satisfaction relative to study achievement [8]. These studies offer significant suggestions in comprehending how study contributes to career development and self-growth. Moreover, from the viewpoint of circulation of knowledge, where adult learners contribute to continuous educational enhancement of the entire society through adult learning, is also very significant in understanding study motivation and achievement [10].

Numerous researchers have confirmed that support from work environment and family play important roles in maintaining study motivation and continuous study. For example, Miyoshi has underscored that workplace environment has marked effect on study motivation [8]. Above all, adequate support from the workplace makes it easier for adult learners to continuously study and improve satisfaction relative to their study achievements [8]. Tsukahara *et al.* has indicated that domestic support is essential to continuous study, and that less support can dangerously lower study motivation and halt study.

Connection with human networks and companies formed during study sessions can indirectly affect study achievement. Although specific research findings are scarce, Tsukahara has indicated that experiences through which adult learners can gain as a part of career development can be the potential of providing opportunities of networking and information exchange [9]. The establishment of human networks can enhance the possibility of deepening study and serve as an element that contributes to career development.

Furthermore, whether the impact of engagement in college or graduate school after graduation can have an impact on the desire to do continuous study for adult learners is also gaining attention. For

example, according to Miyoshi, the desire to obtain broad insight and knowledge is underscored as motivation for relearning [8]. It has been implied that such a desire can trigger adult learners to maintain the relationship with their alma mater even after finishing relearning to deepen their knowledge and keep doing continuous study [8]. Meanwhile, Tsukahara has shown that studying at professional graduate school has proven to be useful for practical business [9]. Making use of the latest specialized knowledge and networking through one's alma mater after graduation can be a contribution to career development [9]. Further research is required to show how these kinds of engagement could contribute to career development and self-realization.

3.2 Setting up Hypotheses

Based on the implications from the related works, we propose the following four hypotheses about the study motivation and achievements of adult learners.

Hypothesis 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.

The associations between study achievements and occupations are presumed to be strong. Since study content directly related to their works possesses practical and immediate values for learners, their satisfaction relative to their study achievements is regarded to be high. This hypothesis is based on the premises that learning will produce specified achievements in career development and job performance.

Hypothesis 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.

Obtaining their targeted degree or qualification is widely known as a method to reinforce competition in the labor market. This method results in higher possibility of specified career achievements such as promotion or salary increase. This hypothesis indicates that getting a degree or qualification plays an important role in career advancement and job performance.

Hypothesis 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.

As networking is a vital resource in career development, the relationship established during study sessions are regarded as greatly influencing post-graduate career opportunity and study durability. This hypothesis aims to reveal how human networks contribute to study achievement and career development.

Hypothesis 4: Adult learners who feel strong engagement with college or graduate school even after graduation have high motivation to keep studying.

Post-graduate engagement can make contributions to keeping desires to study and to pursue new study opportunities. Graduates with strong engagement are expected to maintain continuous study motivation by using networking and resources via their alma maters. The objective of this hypothesis is to clarify how the degree of engagement affects study durability.

These hypotheses are based on the implications of the previous literature and are intended to clarify factors that affect study motivation and achievement. From these multiple viewpoints, the purpose of our work is to provide new insights contributing to improvement of study motivation and achievement of adult learners.

4 Analysis of Questionnaire

4.1 Summary of Questionnaire

For the purpose of verifying the hypotheses stated in Section 3, we start our analysis by using the questionnaire subject to adult learners who got their degrees so that latent effects and changes of adult learners can be analyzed. The questionnaire used for the analysis is “Survey About Study Desire and Study Achievements of Businesspersons,” which is provided by INTAGE, one of the leading Japanese marketing survey and research corporations. The outline of the questionnaire is summarized in Table 1. This questionnaire could be regarded as shedding light on what has affected adult learners during their study at college or graduate school.

Table 1: Outline of Questionnaire

Survey duration	2024 Mar. 14 - Mar. 18
Number of samples	679
Number of valid samples	320
Response rate	47.10%
Number of samples	Male: 202, Female: 118
Average age	Male: 48.7, Female: 45.7

The questionnaire consists of 19 main questions, as shown in Table 2. Their answer format is either descriptive form, multiple-choice based on given options, or five-level choice <1: Agree, 2: Somewhat Agree, 3: Neither, 4: Somewhat Disagree, 5: Disagree>. Type of answer format is given as either “Descriptive form,” “Multiple-choice” or “Five-level” in the column entitled “Answer Format.” Among these questions, in order to see the relationships between questions about before enrollment and those about after graduation are extracted. Therefore, it focuses on three main questions on before enrollment (Q2, Q3 and Q4) and three on after graduation (Q8, Q9 and Q10). In Table 2, the former three are shaded in yellow, while the latter three in blue. Therefore, investigating the relationships between these two groups could lead to revealing implicit effects and changes.

Table 2: Main 19 Question Topics of the Questionnaire

No.	Question Content	Answer Format	No.	Question Content	Answer Format
Q1	Please tell us your workplace/life environment when you came to think of studying at college or graduate school.	Two-option (Yes/No)	Q11	Besides Q10, please fill in if there would be any relationship with your college or graduate school. <<Optional>>	Descriptive form
Q2	Please tell us your mind when you came to think of studying at college or graduate school.	Five-level	Q12	Would you feel any relationships (engagement) with college or graduate school after graduation or attending lectures?	Multiple-choice
Q3	Please tell us what motivated you to study at college or graduate school.	Five-level	Q13	Please choose your educational background before being working adult.	Multiple-choice
Q4	Please tell us what led you to study at college or graduate school.	Five-level	Q14	In working, there are several ways of thinking. After reading each subdivided question, please tell us how important it is when you work.	Five-level
Q5	Please tell us your age when you started to study at college or graduate school after becoming working adults.	Descriptive form	Q15	We would like you to ask about study experiences after being working adult. Please tell use your college or graduate school.	Multiple-choice Descriptive form
Q6	Please tell us what type of college or graduate school you started to study after becoming working adults.	Multiple-choice	Q16	Please tell us all the "national" college or graduate school you know for working adults.	Multiple-choice
Q7	Please tell us what field of college or graduate school you started to study after becoming working adults.	Multiple-choice	Q17	Please tell us all the "public" college or graduate school you know for working adults.	Multiple-choice
Q8	Please tell us what you obtained and thought about learning at college or graduate school as a working adult student.	Five-level	Q18	Please tell us all the "private/business" college or graduate school you know for working adults.	Multiple-choice
Q9	Please tell us if what you thought you wanted to learn at college or graduate school could be realized.	Five-level	Q19	Please tell us all the "private, information/design" college or graduate school you know for working adults.	Multiple-choice
Q10	Please tell us the relationships with college or graduate school after graduation from or taking classes at college or graduate school.	Five-level			

For convenience of classification, as shown in the column entitled “Notation” in Table 3, three questions before enrollment are denoted as “Mind,” “Motivation,” and “Opportunity,” while three after graduation are denoted as “Acquisition,” “Realization,” and “Bond.” In addition, each main question has subdivided questions. The numbers of subdivided questions for Q2, Q3, Q4, Q8, Q9 and Q10 are 12, 12, 13, 14, 12 and 11, respectively. Taking an example of main question Q2 (“Mind”), its subdivided questions are denoted as “Q2_1,” “Q2_2,” ... “Q2_12.” The notations of questions before enrollment and those after graduation and their summarized notations are shown in Table 3. The detailed contents of the subdivided questions are omitted due to space limitation. Hence, 37 subdivided questions before enrollment and 37 after graduation are used for the subsequent analysis. As shown in Table 1, out of the valid 360 samples from the questionnaire, 107 were used for the analysis as they completely answered the main six questions (Q2 – Q4 and Q8- Q10) with no missing values.

Table 3: Subdivided Questions Before Enrollment and After Graduation

(a) Before enrollment (Q2, Q3, Q4)

No.	Notation	No.	Notation	No.	Notation
Q2_1	feeling behind	Q3_1	Basic knowledge	Q4_1	Familiar learner
Q2_2	Stimulation	Q3_2	Specialized knowledge	Q4_2	Bad role models
Q2_3	Escapism	Q3_3	Promotion	Q4_3	Activity experiences
Q2_4	Belonging	Q3_4	Degree	Q4_4	Introduction (close)
Q2_5	Challenging	Q3_5	Educational background	Q4_5	Introduction (workplace)
Q2_6	Future in the life	Q3_6	Certification	Q4_6	Study subject
Q2_7	No regrets	Q3_7	Insight	Q4_7	Professors
Q2_8	Working at will	Q3_8	Systematization	Q4_8	Benefits & Grants
Q2_9	Experience	Q3_9	Higher salary	Q4_9	SNS/blog
Q2_10	Social contribution	Q3_10	Preparation	Q4_10	School information session
Q2_11	Limitation of my work	Q3_11	Link-minded friends	Q4_11	Location
Q2_12	Organizing work experience	Q3_12	Social network	Q4_12	Studying time
				Q4_13	Study expenses

(b) After graduation (Q8, Q9, Q10)

No.	Notation	No.	Notation	No.	Notation
Q8_1	Stimulating days	Q9_1	Success: basic knowledge	Q10_1	Participation: event
Q8_2	Fulfilling days	Q9_2	Success: specialized knowledge	Q10_2	Participation: association
Q8_3	Broadened horizons	Q9_3	Success: promotion	Q10_3	Participation: seminar/lab
Q8_4	New way of thinking	Q9_4	Success: degree	Q10_4	Participation: club/society
Q8_5	Confidence	Q9_5	Success: educational background	Q10_5	Participation: SNS
Q8_6	Acknowledgement	Q9_6	Success: certification	Q10_6	Contribution: donation
Q8_7	Custom of studying	Q9_7	Success: broadened insight	Q10_7	Authorized people
Q8_8	Usage of time	Q9_8	Success: systematization	Q10_8	Lecture/Library
Q8_9	Learning attitude	Q9_9	Success: higher salary	Q10_9	Contact: graduate
Q8_10	Continuous study	Q9_10	Success: preparation	Q10_10	Contact: professor
Q8_11	Increased income	Q9_11	Success: link-minded friends	Q10_11	Connnection: business
Q8_12	New job (in company)	Q9_12	Success: social network		
Q8_13	New job (new company)				
Q8_14	Start-up				

4.2 Multiple Regression Analysis

In order to investigate the effects and changes between before enrollment and after graduation of adult learners, multiple regression analysis was conducted for the 107 samples. 37 subdivided questions (Q2, Q3, Q4) before enrollment are set as explanatory variables, whereas 37 subdivided questions after graduation summarized are employed as respondent variables.

4.3 Analysis Result

As one form of estimation result of multiple regression analysis, multiple correlation coefficients (MCCs), which indicate estimation accuracy, can be obtained. MCCs for the 37 respondent variables are summarized in Table 4. From these results, the following four cases especially show high estimation accuracy; Q8_11 “Increased income,” Q8_14 “Start-up,” Q9_9 “Success: higher salary,” and Q10_6 “Contribution: donation.” On the other hand, there are nine cases with MCCs below 0.8, whereas all the subdivide questions of Q10 possess MCCs over 0.8. Nevertheless, 28 out of 37 cases show MCCs are beyond 0.8, indicating good estimation accuracy. From this viewpoint, it could be implied that relationships between the questions on before enrollment and those on after graduation for adult learners can be observed.

Table 4: Multiple Correlation Coefficients (MCCs) for Each Respondent Variable

Q8		Q9		Q10	
No.	MCC	No.	MCC	No.	MCC
Q8_1	0.748	Q9_1	0.779	Q10_1	0.816
Q8_2	0.811	Q9_2	0.801	Q10_2	0.861
Q8_3	0.763	Q9_3	0.824	Q10_3	0.818
Q8_4	0.832	Q9_4	0.655	Q10_4	0.829
Q8_5	0.833	Q9_5	0.803	Q10_5	0.852
Q8_6	0.850	Q9_6	0.637	Q10_6	0.878
Q8_7	0.790	Q9_7	0.784	Q10_7	0.802
Q8_8	0.822	Q9_8	0.750	Q10_8	0.805
Q8_9	0.777	Q9_9	0.872	Q10_9	0.814
Q8_10	0.747	Q9_10	0.793	Q10_10	0.825
Q8_11	0.880	Q9_11	0.820	Q10_11	0.857
Q8_12	0.854	Q9_12	0.820		
Q8_13	0.825				
Q8_14	0.882				

5 Considerations

In order to give interpretations on the results obtained through multiple regression analysis, there is a method to focus on explanatory variables with larger standardized partial regression coefficients (SPRCs). Extracting several explanatory variables with bigger SPRCs can indicate how strong these explanatory variables (questions before enrollment) could influence a respondent variable (those after graduation). Here, these explanatory variables and SPRCs are summarized in Table 5. For each set of respondent variables, their respective three explanatory variables with biggest SPRCs are shown in the columns entitled “Explanatory Variable 1,” “Explanatory Variable 2” and “Explanatory Variable 3.”

Table 5: Top Three Explanatory Variables with Biggest Standardized Partial Regression Coefficients (SPRCs)

(a) Q8 “Acquisition”

Respondent Variable		Explanatory Variable 1	SPRC	Explanatory Variable 2	SPRC	Explanatory Variable 3	SPRC			
Q8_1	Stimulating days	Q2_12	Organizing work experience	0.439	Q3_4	Degree	0.305	Q3_7	Insight	0.301
Q8_2	Fulfilling days	Q2_12	Organizing work experience	0.451	Q2_7	No regrets	0.362	Q4_4	Introduction (close)	0.333
Q8_3	Broadened horizons	Q3_7	Insight	0.362	Q2_12	Organizing work experience	0.310	Q4_3	Activity experiences	0.301
Q8_4	New way of thinking	Q3_7	Insight	0.436	Q4_4	Introduction (close)	0.317	Q4_7	Professors	0.285
Q8_5	Confidence	Q4_4	Introduction (close)	0.567	Q3_5	Educational background	0.379	Q3_10	Preparation	0.353
Q8_6	Acknowledgement	Q4_4	Introduction (close)	0.358	Q3_12	Social network	0.295	Q3_5	Educational background	0.290
Q8_7	Custom of studying	Q4_6	Study subject	0.328	Q2_3	Escapism	0.321	Q3_12	Social network	0.251
Q8_8	Usage of time	Q2_7	No regrets	0.321	Q3_11	Link-minded friends	0.306	Q2_2	Stimulation	0.303
Q8_9	Learning attitude	Q3_7	Insight	0.290	Q4_6	Study subject	0.227	Q2_8	Working at will	0.225
Q8_10	Continuous study	Q2_12	Organizing work experience	0.335	Q3_7	Insight	0.300	Q3_11	Link-minded friends	0.295
Q8_11	Increased income	Q2_10	Social contribution	0.314	Q2_11	Limitation of my work	0.314	Q3_8	Systematization	0.260
Q8_12	New job (in company)	Q2_11	Limitation of my work	0.300	Q3_8	Systematization	0.263	Q3_5	Educational background	0.238
Q8_13	New job (new company)	Q2_8	Working at will	0.335	Q2_11	Limitation of my work	0.246	Q4_7	Professors	0.235
Q8_14	Start-up	Q4_9	SNS/blog	0.528	Q4_4	Introduction (close)	0.218	Q4_13	Study expenses	0.209

(b) Q9 “Realization”

Respondent Variable		Explanatory Variable 1	SPRC	Explanatory Variable 2	SPRC	Explanatory Variable 3	SPRC			
Q9_1	Success: basic knowledge	Q3_1	Basic knowledge	0.524	Q2_12	Organizing work experience	0.312	Q3_8	Systematization	0.196
Q9_2	Success: specialized knowledge	Q3_2	Specialized knowledge	0.347	Q4_7	Professors	0.236	Q3_1	Basic knowledge	0.225
Q9_3	Success: promotion	Q3_5	Educational background	0.399	Q3_3	Promotion	0.318	Q3_1	Basic knowledge	0.281
Q9_4	Success: degree	Q3_5	Educational background	0.396	Q4_4	Introduction (close)	0.367	Q3_12	Social network	0.330
Q9_5	Success: educational background	Q3_5	Educational background	0.525	Q3_10	Preparation	0.478	Q4_7	Professors	0.370
Q9_6	Success: certification	Q3_6	Certification	0.313	Q3_10	Preparation	0.303	Q3_12	Social network	0.258
Q9_7	Success: broadened insight	Q3_2	Specialized knowledge	0.653	Q3_7	Insight	0.389	Q4_6	Study subject	0.308
Q9_8	Success: systematization	Q3_8	Systematization	0.342	Q3_12	Social network	0.315	Q4_9	SNS/blog	0.225
Q9_9	Success: higher salary	Q4_13	Study expenses	0.350	Q2_10	Social contribution	0.301	Q2_6	Future in the life	0.210
Q9_10	Success: preparation	Q3_10	Preparation	0.560	Q4_7	Professors	0.532	Q2_11	Limitation of my work	0.332
Q9_11	Success: link-minded friends	Q2_11	Limitation of my work	0.502	Q2_10	Social contribution	0.396	Q3_10	Preparation	0.335
Q9_12	Success: social network	Q3_10	Preparation	0.419	Q2_10	Social contribution	0.398	Q2_7	No regrets	0.304

(c) Q10 “Bond”

Respondent Variable		Explanatory Variable 1	SPRC	Explanatory Variable 2	SPRC	Explanatory Variable 3	SPRC			
Q10_1	Participation: event	Q3_3	Promotion	0.284	Q4_9	SNS/blog	0.275	Q4_2	Bad role models	0.267
Q10_2	Participation: association	Q4_9	SNS/blog	0.374	Q3_11	Link-minded friends	0.223	Q3_3	Promotion	0.208
Q10_3	Participation: seminar/lab	Q4_7	Professors	0.537	Q2_4	Belonging	0.480	Q2_8	Working at will	0.330
Q10_4	Participation: club/society	Q4_2	Bad role models	0.238	Q4_3	Activity experiences	0.229	Q4_10	School information session	0.208
Q10_5	Participation: SNS	Q4_9	SNS/blog	0.478	Q2_4	Belonging	0.285	Q4_4	Introduction (close)	0.276
Q10_6	Contribution: donation	Q4_9	SNS/blog	0.529	Q2_7	No regrets	0.347	Q4_7	Professors	0.293
Q10_7	Authorized people	Q4_4	Introduction (close)	0.444	Q3_2	Specialized knowledge	0.385	Q3_11	Link-minded friends	0.235
Q10_8	Lecture/Library	Q4_9	SNS/blog	0.524	Q3_2	Specialized knowledge	0.462	Q4_7	Professors	0.311
Q10_9	Contact: graduate	Q2_4	Belonging	0.479	Q3_10	Preparation	0.398	Q4_7	Professors	0.361
Q10_10	Contact: professor	Q2_10	Social contribution	0.429	Q2_4	Belonging	0.341	Q4_1	Familiar learner	0.293
Q10_11	Connection: business	Q4_7	Professors	0.297	Q2_10	Social contribution	0.268	Q4_4	Introduction (close)	0.240

The explanatory variables shown in Table 5 are tried to be associated with the four hypotheses provided in Section 3.2 to verify them. Each hypothesis is validated through interpretation of the results of multiple regression analysis:

- **Hypothesis 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.

Q9_3 “Success: promotion” has strong connections with Q3_5 “Educational background” and Q3_1 “Basic knowledge.” This result coincides with the assumption of strong relationships between study achievements and occupations. The associations between Q8_12 “New job (in company)” and Q3_5 “Educational background” could account this hypothesis.

- **Hypothesis 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.

Similar to Hypothesis 1, Q9_3 “Success: promotion” implies that career advancement and job performance are considerably attributed to obtaining degrees or qualifications. Furthermore, Q8_6 “Acknowledgment,” which may eventually result in career advancement, has stronger associations with Q3_5 “Educational background.” Additionally, Q8_11 “Increased income” is somewhat connected with Q3_8 “Systematization,” as a consequence of organizing knowledge. In the broad sense, these aspects could be included in career advancement.

- **Hypothesis 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.

In terms of study, Q8_10 “continuous study” is strongly related to Q3_11 “Like-minded friends.” This result corresponds to the post-graduate study durability owing to relationships formed during study. The strong relationships between Q10_2 “Participation: association” and Q3_11 “Like-minded friends” and those between Q10_3 “Participation: seminar/lab” and Q9_10 “Success: preparation” could also be accountable for this aspect. Meanwhile, as for career development, the following three combinations coincide with the associations between relationships and career opportunity after graduation; Q8_13 “New job (new company)” and Q4_7 “Professors,” Q8_14 “Start-up” and Q4_9 “SNS/blog,” and Q9_10 “Success: preparation” and Q4_7 “Professors.”

- **Hypothesis 4:** Adult learners who feel strong engagement with college or graduate school even after graduation have high motivation to keep studying.

Q10_8 “Lecture/Library” is mainly related to Q4_9 “SNS/blog” and Q4_7 “Professors.” It could be implied that continuous study would be influenced by post-graduate engagement. Similarly, Q10_8 “Lecture/Library” is associated with Q4_7 “Professors” and while Q10_3 “Participation: seminar/lab” has strong connection with Q4_7 “Professors.” Three of these examples point to relationship with Q4_7 “Professors,” indicating that professors would be a key factor to form learning attitude even after graduation.

From these considerations, it could be concluded that our hypotheses would be validated through interpreting the analysis results of multiple regression analysis in terms of focusing on the three strongest SPRCs.

6 Conclusion

This paper aims to analyze the implicit factors of study motivation and continuous study of adult learners, as well as to comprehend what encourages them or prevents them from continuous study activities. Based on the earlier studies on study motivation and continuous study, four hypotheses regarding them were formulated. With a view to validating these hypotheses, we analyzed questionnaires targeting adult learners who completed college or graduate school. Through multiple regression analysis, questions on their situation before enrollment were set as explanatory variables, whereas those on their situation after graduation were set as respondent variables. As a result of analysis, the relationships between before and after studying at college or graduate school could be observed. Moreover, through the interpretation of the analysis results, potential effects and changes of adult learners could be associated with the four hypotheses. It could also be suggested that the questionnaire would be effective in investigating those effects and changes.

There are several requirements and future work that must be addressed. Based on the questionnaire targeting the situations before enrollment and after graduation, this research performed initial analysis about study motivation and achievement of adult learners. However, since study motivation and achievement can vary as time passes, longitudinal surveys would be more effective in clarifying such changes.

The questionnaire used for this analysis and provided by INTAGE was answered by general adult learners. For future work, such as the affiliation of the authors, we would like to focus on specific universities aiming at relearning of adult learners. Firstly, a similar questionnaire targeting the graduates will be carried out. By comparing the questionnaire results with those carried out by INTAGE, both similarities and differences can be observed among study motivation and achievement, resulting in more profound understanding the characteristics of learners at specific educational institutions.

Moreover, it is also important to track the changes of study motivation between at time of enrollment and after graduation. For example, there could be a case where a learner who initially aimed at career achievements would come to emphasize self-realization through study. By grasping such changes of motivation, educational institutions and decision-makers can obtain valuable data to design more flexible study support.

For future research, as shown above, 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 better contribute to practical assistance and policy recommendation for adult learning. Additionally, the characteristics of adult learner 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.

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