

Generic Skill Extension Analysis of Dental Students Using the Prog Test-Development and Measurement and Evaluation of Generic Skills at the Time of Lower Grade Dentistry Education

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ABSTRACT

In recent years, it is required to train professional knowledge in higher education and foster the ability to be active as a generic skill called a generic skill. Although each ministry or agency defines this generic skill in various ways and advocates its necessity, it is an indispensable capability for dentists after graduation and training and evaluation of skills is also important in dental education. However, in dental education so far, it is insufficient in terms of nurturing generic skills throughout undergraduate course education. Also, knowledge, understanding and professional competence have been evaluated when evaluating the acquired learning outcomes, but high-level integrated capacities such as generic skills have not been evaluated.

Therefore, in order to measure generic skills trained in dental education, we started the examination of PROG test for first year students from FY 2016. In order to verify whether the student who took the 2016 examination comprehensively examined whether the generic skills were trained by the studies at the university in comparison with the judgment result of the examination of the third year of 2018, only the area where the skill score improves according to the measurement area It is reported that there is a possibility that it can be utilized for nurturing generic skills of dental students.

INTRODUCTION

Recently, higher education is required to foster new power called generic skill. Generic skills are defined as higher-order skills that can be applied under various circumstances and include skills of creation, flexibility, independence, teamwork, communication skills, critical thinking skills, time management, leadership, planning. It encompasses various abilities such as self-management ability ^[1]. The OECD (Organization for Economic Cooperation and Development) has the ability to deal with complex tasks and demands within a specific context as well as mere knowledge and skills as a basic learning ability over individual lives, Ability to act autonomously and ability to interact in social heterogeneous groups and ability to utilize social, cultural, and technical tools interactively as key competencies ^[2]. In Japan, Ministry of Health, Labor and Welfare announced the findings of the findings collectively Public Employment Fundamentals ^[3]. Basic People for Society advocated by Ministry of Economy, Trade and Industry ^[4]. Bachelor Degree presented by the Central Education Council ^[5] and other ministries and agencies have defined them in various forms and advocate their necessity.

In dental education, it is essential to acquire general-purpose skills such as interpretation of acquired contents, application to problem solving, integration of multiple acquired contents and clinical reasoning, and it is also indispensable for a dentist after graduation is there. The Ministry of Economy, Trade and Industry is not a special program aimed at nurturing generic skills only, but says that it is desirable to develop capacity in programs related to university major ^[6], but it is fostering generic skills throughout undergraduate course education There are few universities ^[7].

It is reported that there are many cases that are often positioned in the first year education and liberal arts education [1,8]. Also, evaluation of acquired content in dental education so far had been evaluated knowledge/ understanding and professional ability, but high-level integrated ability such as generic skill was not evaluated, both training and evaluation there seems to be a problem.

In our university we introduced the PROG test in FY 2016 to nurture and measure generic skills throughout undergraduate course education. We took the examination of the PROG test in 1st year in 2016, 1 year in 2017, 1st year and 2018 year trial. This year, the student who took the examination in the first year of 2016 passed the 2 years of university education and again took the PROG test. Therefore, this time we will report on comparing and examining the judgment result of the PROG test of the first year and the third year for the purpose of examining how the generic skill at the time of admission grows in the education at the university.

OBJECT AND METHODS

Study research using the teaching data at our university was written to the target student in writing and verbally at the orientation at the beginning of 2018 and it was done with consent in writing. For minor students, they explained in written form to the guardian along with the consent of the student himself, and obtained consent from the guardian in writing. This research study adopted the principle of the Helsinki declaration, with approval of the Fukuoka Dental College Ethics Review Committee.

Object

Students who enrolled in the first year in fiscal 2016 and who took the PROG test conducted on April 12 of the same year, enrolled in the third year in 2018 and taken the PROG test conducted on April 18 the same year 82 the target was for the name.

ANALYSIS OF PROG TEST RESULTS

The outline of the PROG test is shown in **Table 1**. Regarding the literacy test, the judgment result of seven stages in literacy comprehension, and the judgment result of five stages in six items of the four powers of problem solving skills and processing ability were used. Regarding the competency test, the judgment result of seven levels with the three competencies of comprehensive competency and competency, and the five judgment results for the nine elements which further decomposed the competency's three powers were used.

Table 1. PROG (Progress Report on Generic Skills) test outline.

Literacy Test		Literacy				
Format:	Mark format	6 Skills				
Questions:	30 problems	Overall Literacy	Problem-solving Skills	Data Collection	4 Skills	
Time allowed:	45 minutes			Data Analysis		
Areas measured:	Problem-solving ability (Data Collection/Data Analysis/Identifying Problems/Conceptual Ability)			Identifying Problems		
	"Verbal" and "Non-verbal" Processing Skills			Conceptual Ability		
Competency Test				Processing Skills	Expressiveness	Not measured
Format:	Mark format	Execution				
Questions:	Two-Sided Selection Method: 195 questions	Competency				
	Hypothetical Scenario (short answer): 50 questions	Overall Competency	3 Skills	9 Elements		
	Hypothetical Scenario (long answer): 6 questions			Basic Problem-Oriented Skills	Identifying Problems	
	Total: 251 questions				Planning	
Time allowed:	40 minutes	Basic Interpersonal Skills	Practical Ability			
Areas measured:	Basic Problem-Oriented Skills (Identifying Problems/Planning/Practical Ability)		Affinity			
	Basic Interpersonal Skills (Affinity/Cooperation/Leadership)		Cooperation			
	Basic Self-Management Skills (Emotional Control/Creative Confidence/Perseverance)	Basic Self-Management Skills	Leadership			
	Emotional Control					
			Creative Confidence			
			Perseverance			

Usage data

After concatenating the judgment results of the PROG tests taken during the first year of 2016 and the third year of 2018 with the student ID number, the student ID number was deleted and it was used as the data which made it unconsolidable anonymously.

Statistical processing

For the 1st and 3rd year PROG tests, the difference in the mean value of the judgment results of each element was examined by Wilcoxon's signed rank test.

RESULTS

Literacy score **Figure 1** shows the average score of the first grade and third grade of each literacy test area. The average value of literacy comprehension, information analysis ability, problem finding ability, planning ability, nonverbal processing ability decreased, meaningful difference was recognized in all areas. In addition, although the average value of information gathering ability and language processing ability was improved, no significant difference was recognized (**Table 1**).

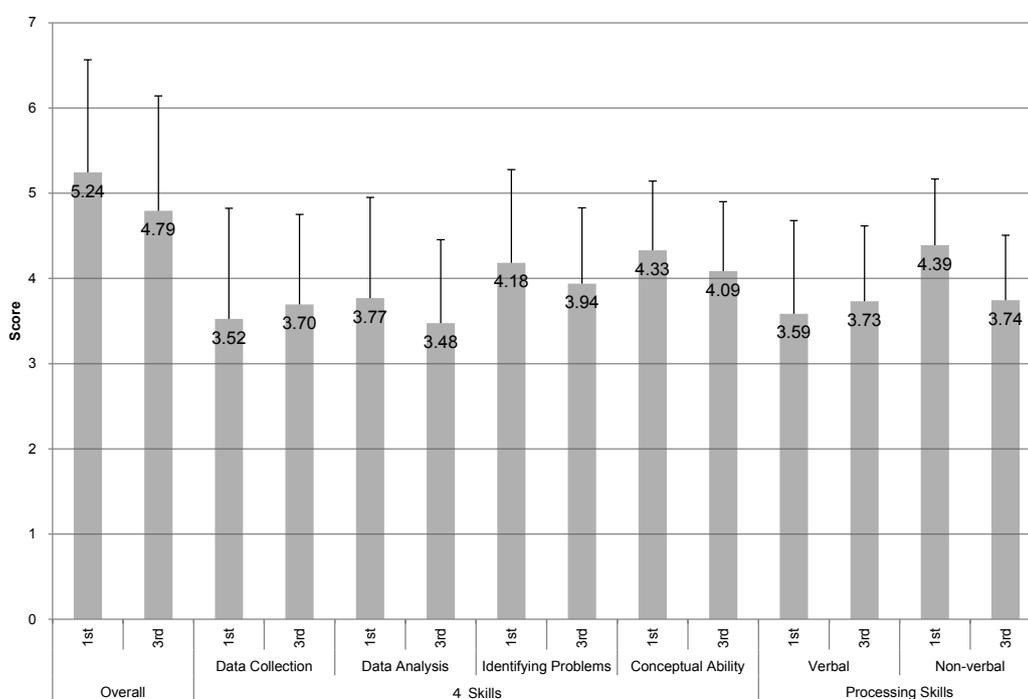


Figure 1. Literacy evaluation score average change (1st to 3rd year).

Figure 2 shows the ratios of the changes in the score of the first grade to the third grade (3 groups of decrease, no change and improvement) for the entire literacy test measurement area. In students with literacy total of 25.6%, information gathering capacity 36.6%, information analysis power 18.3%, task discovery power 20.7%, planning ability 20.7%, language processing capacity 32.9%, non-language processing ability 6.1%. The score was improved.

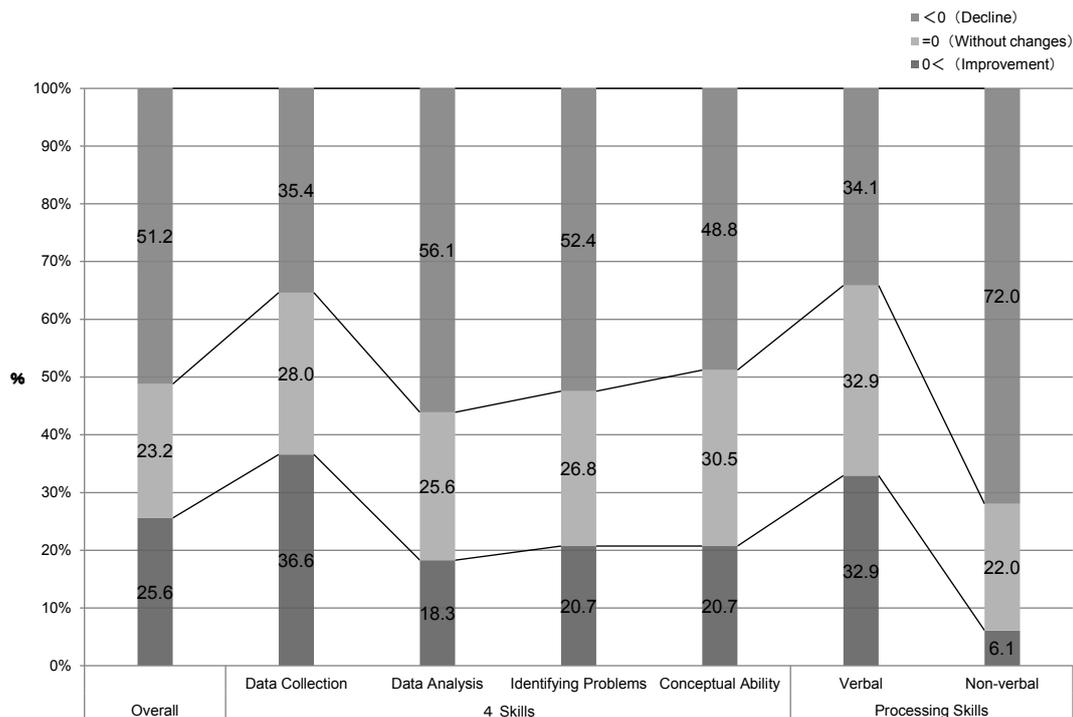


Figure 2. Literacy evaluation score the rate of the increased/decreased student 1st to 3rd year).

Competency scores the average scores of the first grade and third grade of each measurement area of the competency test are shown in Figure 3.

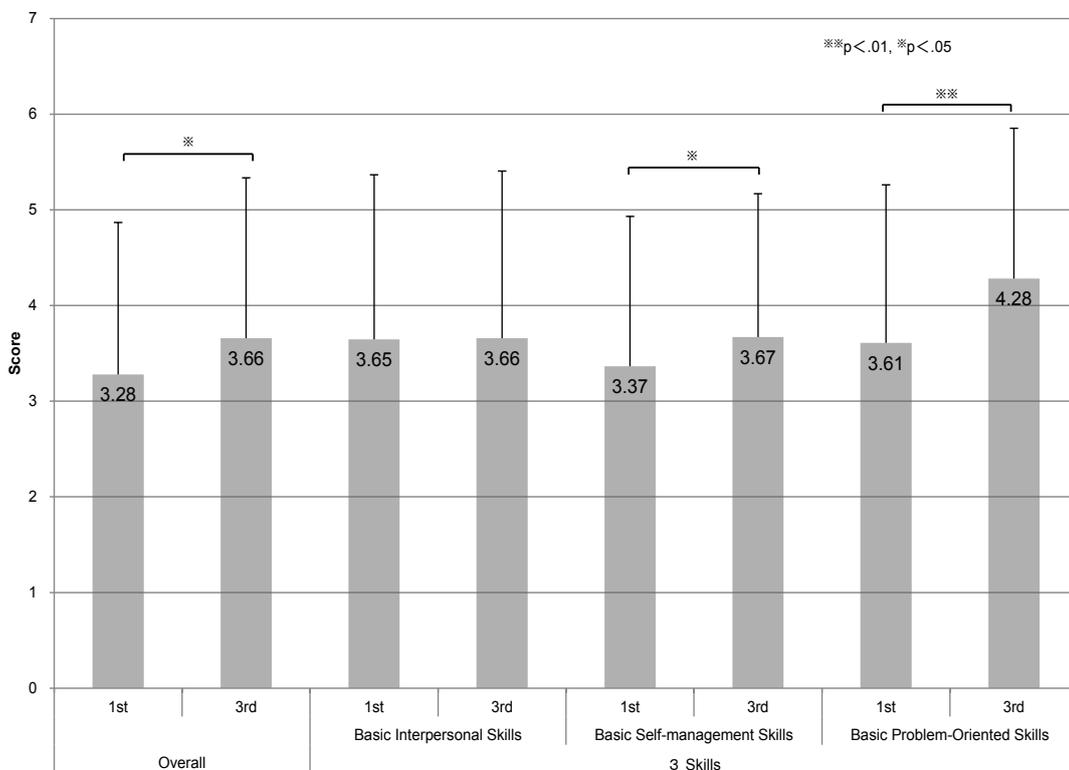


Figure 3. Competency evaluation score overall, (3 Skills) Average change (1st to 3rd year).

Average values are improved for all areas of competency integration and three power, competency synthesis; significant differences were found in the three areas of interpersonal foundation ability and subject basic skill. In the nine elements, the average value has improved with seven factors: leadership, emotion control ability, self-confidence creation ability, behavior sustainability, task discover ability, planning ability, practical skill, and mean values are improved, and confidence creation ability and problem discover ability and three factors of practical ability, a significant difference was recognized. In addition, although the average value decreased with two factors of affinity and collaboration power, there was no significant difference.

Figures 4-6 shows the ratios of the changes in the score of the first grade to the third grade (3 groups of decrease, no change and improvement) for the entire competence test area in the competence test. The score was improved for students who were 39.0% overall in competency, 32.9% in interpersonal foundation power, 42.7% in vs. self-foundation power, 57.3% in objective task fundamental power. In terms of nine factors, 28.0% in affinity, 34.1% in cooperation, 34.1% in leadership, 47.6% in emotional control power, 46.3% in confidence creation power, 41.5% in behavior sustainability, 61.0% in task discovery power, plan Score was improved in students with planning skills of 48.8% and practical skills of 56.1%.

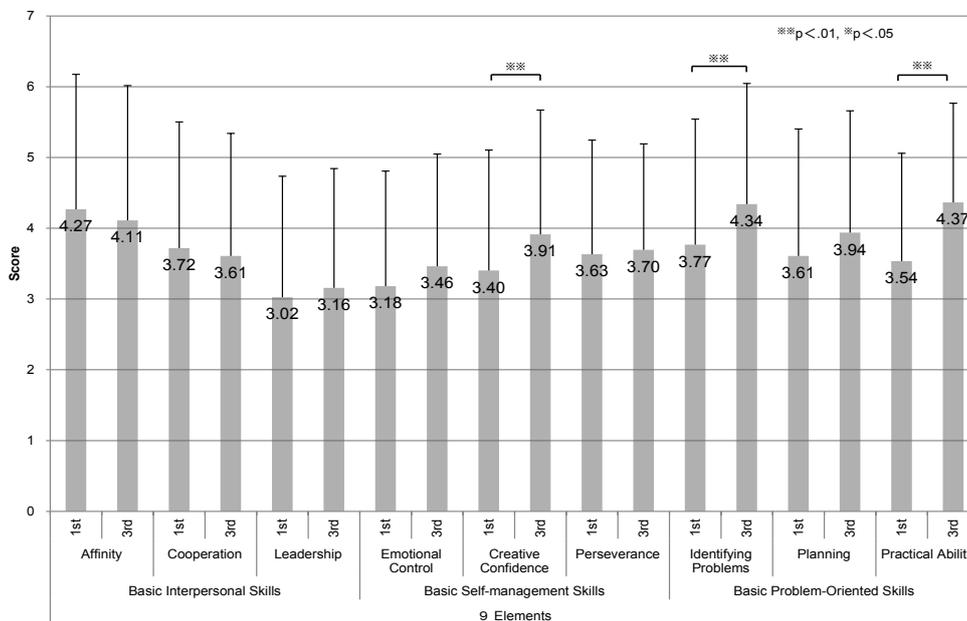


Figure 4. Competency evaluation score (9 Elements) average change (1st to 3rd year).

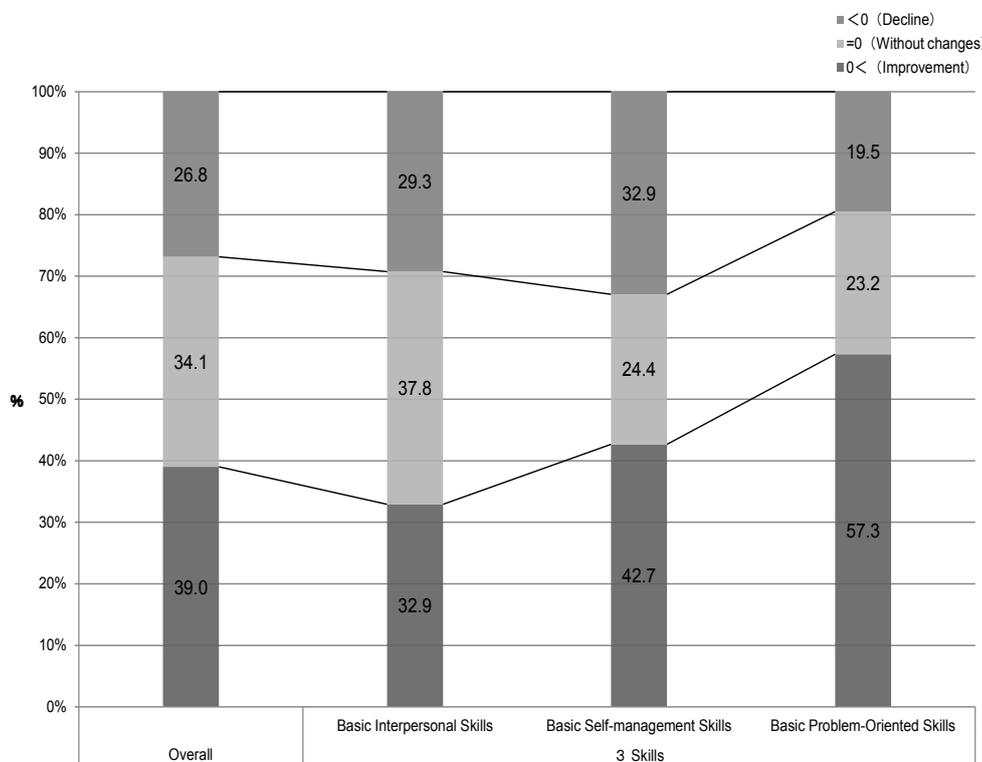


Figure 5. Competency evaluation score (Overall 3 Skills) the rate of the increased/decreased student (1st to 3rd year).

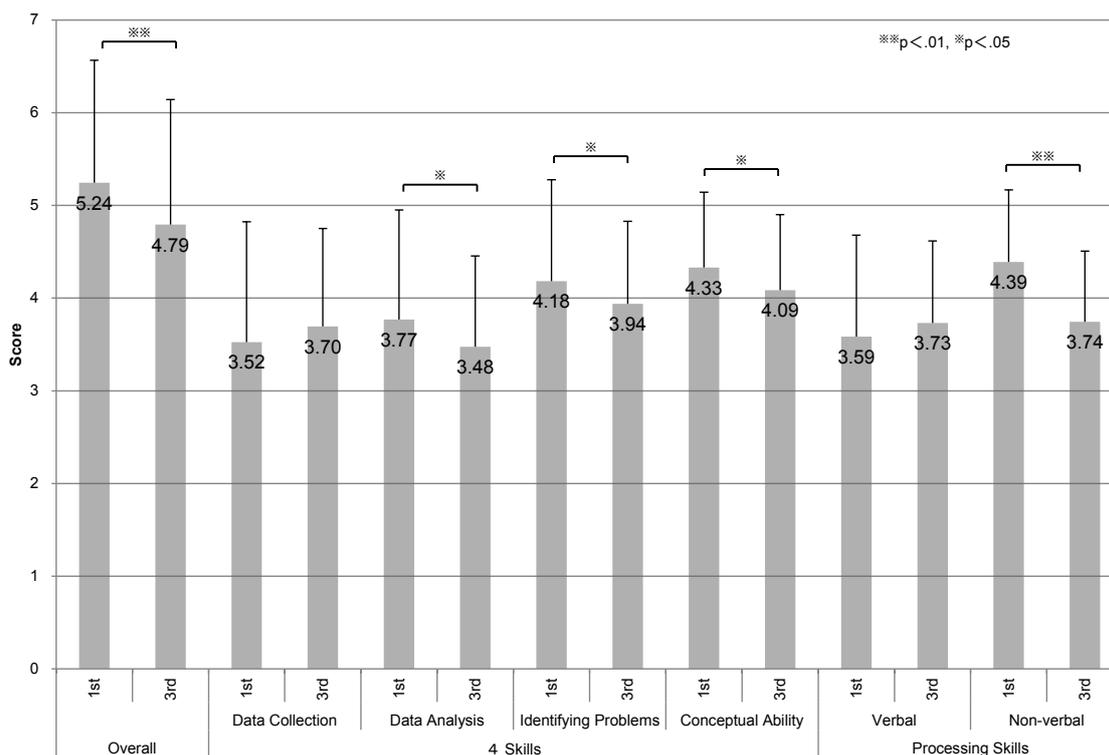


Figure 6. Competency Evaluation Score (9 Elements) the rate of the increased/decreased student 1st to 3rd year).

DISCUSSION AND CONCLUSION

The PROG test used in this study is an assessment test which objectively measures general-purpose ability, attitude, and orientation (generic skills) required by society jointly developed by Kawajuku et al. in two aspects of literacy and competency [9,10]. Since the release in April 2012, about 290 universities and over 250,000 students from all over Japan have taken the examination [11,12]. By utilizing this test, it is possible to objectively grasp the current status of students from the two viewpoints of literacy and competency. We have found correlation between the judgment result of the PROG test and GPA of the first year so far that in the measurement items, significant literacy total. Although a positive correlation is recognized, since there is no significant correlation in the competency synthesis, it is possible to measure the generic skill at the time of admission by implementing the PROG test early after enrolment, and the result of the total literacy is also reported that it is also related to academic ability and first year GPA. Sasagawa [13,14] and Saga et al. [15] reported that they can be used to evaluate the growth of students' generic skills by conducting the PROG test again after several years by comparing the results of initial test. Therefore, I examined what kind of transition the generic skills at the time of admission can be recognized by education at university.

As a result of this study, the literacy score was significantly lower in the four measurement areas excluding information collection ability and language processing ability, out of total and 6 measurement areas. In the transition, the proportion of students who declined was 35.4% in terms of information gathering ability and 34.1% in language processing ability, but 51.2% in total, 48.8% in other areas, especially non-verbal processing ability to 72.0%. It was reached. Regarding this point, Sasagawa has a correlation with the literacy level because there is a question related to charts in some subjects of the University Entrance Examination Test and the University Entrance Examination, whereas in the university's grades evaluation, a test to read information from charts and other data. It is pointed out that there are few problems, correlation with literacy level is likely to occur because college entrance examination exams and university entrance examinations have wider questions than university lesson exam questions [13].

The curriculum of the 1st and 2nd year students of the dental faculty students is centred on linguistic subjects (mathematics, biology, chemistry etc.) and basic subjects of the clinical system (anatomy, physiology, biochemistry etc.) Although only a few months have passed since the entrance examination of the university in the PROG test entrance examination time, more than two years have passed the time to take the PROG test for the third year. It was thought that the change from the academy that enhances the ability related to the measurement area of the literacy level to the study specialized for the examination of the university that is limited in scope.

In contrast, the Competency Score was significantly improved overall. In the three powers, the fundamental strength of interpersonal personality was almost the same, but it increased significantly in the two areas of vs. self-fundamental power and objective fundamental power. In the nine elements, there was a significant increase in the three areas of self-confidence creation power of self-fundamental power and problem discovering ability and practical skill of subject basic problem subject. In this regard, comparing the competency change amount, it is clear that when you compare the competency change amount, you will

grow in order of self-fundamental power, task basic force and interpersonal foundation power. The science system grows more than the literature with all factors and it is pointed out as big ^[16]. Also, it is reported that self-confidence creation ability/emotion control ability in pair-based fundamental ability, problem-discovering ability by subject-matter task fundamental force, leadership of leadership in interpersonal foundation power is large ^[17]. These reports are the results of analysing the generic skills of about 100,000 college students, and the departmental system is also diverse, but even in the examination of our university, the same tendency is recognized with the three powers, even with nine factors, almost similar elongation Admitted.

This result reflects the present situation of Japanese universities that in Japan's higher education, regardless of undergraduate department, undergraduate courses are mainly arts and basic subjects of each major department, study contents are similar. Regarding basic interpersonal skill, the curriculum of the 1st and 2nd year of many dentistry departments in Japan is mainly the basic subjects of the liberal arts subjects and the clinical system, and the subjects and the clinical training that enhances the ability related to the measurement area of interpersonal foundation are It was thought that elongation was not accepted because it will be the curriculum after the third year. In the future, in order to examine the acquisition of generic skills after implementation of these subjects, we are planning to implement the PROG test of the fifth year.

Regarding the measurement and evaluation of generic skills, Morita pointed out that there is little literature on standard tests in previous studies in Japan ^[18]. In addition, Sugitani et al. stated that measurement and evaluation of generic skills depend mainly on student self-evaluation and said that they are conducting interviews and observations of external evaluators, and they are easy to see learning scenes and others It is pointed out that other people are relatively easy to evaluate about behaviors that are easy to see in the scene, and it is difficult to judge the behavior that individuals have taken into consideration and consciousness ^[19].

Meanwhile, Curtis argues that there are four types of assessment of generic skills, comprehensive review by teachers, portfolio created by students, evaluation based on occupational experience, and standard test, which can be mutually complementary ^[20,21]. In this study we used the external standard test PROG test to measure and evaluate generic skills, Yamamoto said that education at university is to foster competency, but evaluation is inadequate, It is pointed out that the evaluation of the positive subjects and their achievements with generic skill training in mind is a subject ^[21].

The ability to respond to the surrounding circumstances by using the characteristics of the decided decision and behavioral style measured from the competency point of view is an essential ability in engaging in dental care, It seems necessary to consider mutually complementary evaluation methods incorporating other evaluations as well as the PROG test in order to fully evaluate the capabilities acquired along with the development of generic skills.

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